NEW

BEGINNER'S GUIDE TO CBD

EVERYTHING YOU NEED TO KNOW ABOUT CANNABIDIOL

100 PAGES OF INFORMATION & ADVICE

How CBD can change your life

Improve your sleep

Explore the healing powers of hemp

Digital Edition

FUTURE
FIRST EDITION

WHAT IS CBD & IS IT LEGAL?

WORK OUT YOUR IDEAL DOSE

FIND YOUR PERFECT PRODUCT

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CALMING BENEFITS DAILY

According to the media, the benefits of CBD knows no bounds – but what's the truth behind this seemingly miracle health remedy and how does it work? In this brand-new publication, we'll delve into the science of CBD and how it differs from marijuana (both medicinal and recreational), as well as how cannabidiol can help with your ailments, whether that's insomnia, anxiety, or chronic pain. Elsewhere, we'll help you determine your individual dose and explore different ways for you to incorporate CBD in your lifestyle, including oils, gummies and even skincare!

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1

SCIENCE

As a cannabis-derived product, CBD has raised a lot of eyebrows, but over the following pages we'll explain why it's safe, legal and how this supplement works

WHAT IS CBD?

There has been a lot of discussion over the benefits of CBD, but if you are unsure about what it is exactly, this guide is for you

WORDS BY **EDOARDO ALBERT**

CBD is one of those fashionable acronyms that is now popping up all over the place. You'll see it mentioned in magazine features, talked about on wellness channels and used by online influencers. It's become a must-have food supplement and the skin oil that the most fashionable YouTubers apply. People are vaping it and using it as a patch. You can buy drinks containing CBD and chew CBD gum. There are even ranges of CBD-infused clothing. But what is CBD, where does it come from and how does it work? In this feature, we will try to answer these questions and more.

As far as the acronym is concerned, it stands for cannabidiol. CBD's full name gives a strong clue as to its origin. Yes, CBD is one of the chemicals that occurs naturally in the cannabis plant. Analysis in the laboratory reveals its molecular formula as $C_{21}H_{30}O_2$, that is, it contains 21 carbon atoms, 30 hydrogen atoms and two oxygen atoms. Structurally, it consists of two carbon hexagons joined by a single link, with a carbon tail. It looks a bit like a two-headed sperm cell.

Image Getty

Getting to the root

Cannabis has been cultivated by humans for around 12,000 years. It originates from the uplands of the Tibetan plateau in Asia and, in the botanical realm, shares a similar molecular structure to hops, another plant with some intoxicating properties.

Cannabis belongs to the genus Cannabaceae (as do hops). Its species is Cannabis sativa L and there are three recognised sub-species: Cannabis sativa ssp. indica, Cannabis sativa ssp. sativa and Cannabis sativa ssp. ruderalis. Cannabis strains grown for drug use have acquired many different names, such as skunk and weed, and following the legalisation of marijuana use in some countries, cannabis growers have been quick to give new names to the fresh varieties of the plant they have bred to distinguish their products in the marketplace.

However, it's important to remember that while these names are used to define different strains of cannabis, they remain the same species of plant. But while they are the same species, there is a great deal of variation within the species and between sub-species. Visually, cannabis can range from the short, stocky indica varieties, which evolved to cope with the tough conditions of the Tibetan plateau, to the tall, rangy sativa sub-species with their thin, splayed leaves (the classic weed symbol shows a sativa-style leaf). These sub-species of cannabis evolved in more tropical locations where they needed to grow tall quickly to reach the light. Indeed, just by looking at the different varieties, it could be difficult to work out that they actually belong to the same species.

For our purposes, the most important difference to note is the variation in the amounts of two particular chemicals: CBD and the other chemical for which cannabis is notorious: THC, or tetrahydrocannabinol. THC is the compound that produces the cannabis high when smoked or ingested. Different varieties of plants can have varying proportions of these two chemicals and plant breeders have been assiduous in producing new strains of cannabis with more THC or more CBD, depending upon the plants' intended end use.

Given the huge chemical and physical differences between varieties of cannabis, it would be easy to think that breeding has produced different species. But botanically they remain the

> "HEMP WAS CAUGHT UP IN ANTI-MARIJUANA LEGISLATION, LEADING TO MANY COUNTRIES OUTLAWING ITS GROWING"

same species. Think of dogs. They range from Great Danes to Chihuahuas but, despite the huge difference in size between the two breeds, they are both dogs. Or, in the botanical realm, consider roses. They vary from the original wild rose through climbing, bush, miniature and giant varieties: the range of plants is enormous but they all remain roses.

The rule of thumb with respect to whether animals and plants belong to the same or different species is whether they can be bred together to produce fertile offspring. It's possible to breed a horse and a donkey together to produce a mule but mules are almost always sterile: therefore, horses and donkeys belong to different species. All the different varieties of cannabis can be cross pollinated to produce fertile offspring, so therefore they all belong to the same species. But it is this variability that makes cannabis such a versatile plant. So versatile, in fact, that half the time people call it by a different name entirely.

Hemp & cannabis

Given that hemp and cannabis have different names and are used for very different purposes, it would be natural to think that they are different species of plant. But botanically, they are not. Both belong to the species Cannabis sativa. The distinction between the two is legal and practical rather than scientific. Hemp has been used for thousands of years, its fibrous nature enabling it to be turned into a very early – possibly the earliest – cloth clothing. During the Age of Sail, hemp was extensively used to make sail canvas and rope. Indeed, hemp ropes gave British sailors their name of 'Jack Tar' since the ropes had to be tarred to stop them rotting.

Hemp was caught up in anti-marijuana legislation, leading to many countries outlawing its growing despite its history of creating useful products. However, hemp growing has been legalised in the UK, US and EU, so long as the THC content remains below a set percentage (0.2 percent in the UK and 0.3 percent in the US and EU). Thus the distinction between hemp and cannabis is primarily a legal one, intended to allow the commercial growing of low-THC cannabis plants.

Hemp oil can easily be confused with CBD, particularly in its oil forms, but they are different chemicals. Hemp oil is made from the seeds of the plant, which is rich in omega-3 fatty acids but contains no CBD or THC compounds. Many people take hemp oil for its health benefits but these lie outside the consideration of this book.

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A plant of parts

If hemp seeds, and indeed cannabis seeds, don't contain THC or CBD, which parts of the plant do? Brush the leaves of a cannabis plant and you will feel the answer. The leaves and flowers of the female plant are coated in trichomes, sticky hairs that the plant produces to protect itself against predators.
Cannabis is an annual. That means it seeds, shoots, flowers and sets seed within a year – under good growing conditions, in a couple of months. Therefore it does not need to live for long but it does need to survive long enough for the female plant's flowers to be fertilised by pollen from the male plants. To that end, the trichomes on female plants produce a set of chemical defences to make the plant unpalatable to herbivores: the cannabinoids that include CBD and THC. Once the flower is fertilised, the female plants stop making cannabinoids so commercial growers cull all the male plants, preventing fertilisation and ensuring the female plants continue producing cannabinoids.
Cannabinoids are concentrated in the leaves and, particularly, the flowers: the stalks, roots and seeds contain almost no cannabinoids (although hemp seeds contain other useful substances). By selective breeding, growers have produced plants that are high in CBD or, alternatively, high in THC. Indeed, the quest for plants to produce highs has led to varieties that have much higher concentrations of THC than the wild varieties. Similarly, growers looking to produce CBD have produced varieties with more of their desired compound.

How cannabis affects the body

That cannabis affects the body, and indeed the mind, has been obvious for thousands of years. But it's only recently that we have begun to understand how it affects us. The psychoactive component of cannabis, THC, was isolated in 1964 by the Israeli chemists Raphael Mechoulam and Yechiel Gaoni.

But the mechanism by which THC and CBD affect us was still unclear until the discovery of the endocannabinoid system (it's often shortened to ECS). If you have never heard of the endocannabinoid system, neither had anyone else 30 years ago and much of how it operates remains unknown even to this day. However, we do know that the endocannabinoid system is crucial in maintaining homeostasis, the stable environment within the body that is vital for our health. The endocannabinoid system affects digestion and the metabolisation of food, sleep cycles, the immune system, stress management and memory formation. It does so via three main routes: specialised receptors; specialised chemicals; and enzymes.

The ECS receptors, known as CB1 and CB2, work with the specialised chemicals produced by the ECS, which are called endocannabinoids. The endocannabinoids lock into the receptors, which then relay this information to the brain. The enzymes work to produce endocannabinoids when needed and break them down when no longer needed.

The key point for our purposes is that the endocannabinoids the body produces naturally are very similar structurally to the cannabinoids, such as CBD and THC, produced by the cannabis plant. Therefore, CBD and THC will affect the body's endocannabinoid system.

Indeed, the wide range of systems that the ECS oversees goes some way to explaining why cannabis use can produce so many different results, ranging from temporal distortions and memory loss to feelings of extreme hunger ('munchies') and paranoia.

CB1 receptors occur mainly in the brain and nervous system. THC locks into CB1 receptors, producing the cannabis high. CBD actually works to prevent THC locking into the CB1 receptors, so cannabis with a high CBD content is a less potent drug than cannabis with a lower CBD content. While CB1 receptors stick to the brain and nervous system, CB2 receptors occur throughout the body as well as the brain, and again THC binds strongly to them while CBD works to block binding.

Within the endocannabinoid system, CBD seems to act as a limiting and balancing influence, preventing other chemicals binding to receptors. We are still only at the beginning of our understanding of how CBD and the endocannabinoids that our bodies produce naturally function within our systems.

> "IT'S ONLY RECENTLY THAT WE HAVE BEGUN TO UNDERSTAND HOW CANNABIS AFFECTS US"

Getting the full CBD

Making the transition from hairs on a plant to a bottle of oil or a skin patch is not, on the face of it, a particularly easy process. CBD is a lipophilic compound, which means that it will dissolve in fats but not in water. Put a drop of CBD in a bowl of water and it will float like oil. CBD can be extracted from the cannabis plant – in the UK, manufacturers have to use hemp as their source plant – in a number of ways but out of all of these, the most common now are carbon dioxide extraction, liquid solvent extraction and alcohol extraction.

Carbon dioxide extraction requires significant investment in equipment but produces very pure CBD as well as the desired range of other cannabinoids, ranging from CBD isolate to full-spectrum CBD. Because carbon dioxide is naturally a gas at normal temperatures, at the end of the extraction process it all vaporises, leaving no residue. However, CBD produced using the carbon dioxide extraction process tends to be more expensive because of the costs of manufacturing the product.

Liquid solvent extraction uses a lipophilic solvent such as butane, propane or isopropyl to dissolve the cannabinoids from the source plant. The mixture is then heated to remove the solvent by evaporation. This process is quick and cheap but involves dealing with flammable liquids and if not done properly, the final product can be tainted with traces of the solvent. The solvent also dissolves chlorophyll as well as cannabinoids, which can lead to the final product tasting bitter.

Alcohol extraction is similar to liquid solvent extraction, the chief difference being the solvent. Distilling out the alcohol from the liquid extraction is straightforward and even if trace amounts of alcohol are left behind, they do not produce any ill effects. As with liquid solvent extraction, alcohol extracted CBD usually has some traces of chlorophyll, which produces a less pleasant taste. The process is cheap and the profile of the final product cleaves closely to the original range of cannabinoids in the source plant.

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WHAT'S THE DIFFERENCE?

CBD comes in three forms: this is how they differ

1 Full-spectrum CBD

Full-spectrum CBD includes all the beneficial chemicals that occur in the botanical source plant, rather than CBD on its own. Many advocates for CBD argue that it works best when it is able to use the entourage effect, that is the natural synergy resulting from the action of the wide range of chemicals in the original plant. Thus, even when using CBD derived from hemp plants, full-spectrum CBD will include a small amount of THC, the psychoactive component of cannabis, as well as a range of terpenes and cannabinoids present in the original plant. The maximum amount of THC present in full-spectrum CBD depends upon the law in different countries. In the UK, it can contain a maximum of 0.2 percent THC, while in the United States the THC limit is set at 0.3 percent. In neither case is this sufficient to produce a cannabis high, particularly when taken in combination with very high amounts of CBD, which acts against the effects of THC.

In addition to CBD, other cannabinoids typically present in full-spectrum CBD include cannabinol (CBN), cannabigerol (CBG), cannabichromene (CBC) and cannabidiolic acid (CBDA). Ideally, the manufacturer should also list the terpenes that are present in the product, although many simply label it as being rich in terpenes.

2 Broad-spectrum CBD

Broad-spectrum CBD falls between full-spectrum CBD and CBD isolate. Unlike full-spectrum CBD, manufacturers aim to remove all the THC from broad-spectrum CBD, leaving it free from the psychoactive part of the cannabis plant. However, in tests some broad-spectrum CBD products have still contained trace amounts of THC. While even less likely to produce a high than the minuscule quantities present in broad-spectrum CBD, people who cannot afford to have any drugs appear in their system, such as commercial airline pilots, might be better off taking CBD isolate rather than broad-spectrum CBD. In common with full-spectrum CBD and unlike CBD isolate, broad-spectrum CBD still contains a range of the other chemicals present in the cannabis plant, including terpenes, cannabinoids and flavonoids. With a range of the other cannabis chemicals present, broad-spectrum CBD is better placed to exploit the natural entourage effect of the plant than CBD isolate.

3 CBD isolate

CBD isolate is, as you might expect, isolated CBD, with no additional chemicals, not even in trace amounts. CBD isolate does not contain any of the chlorophyll, terpenes, cannabinoids or other plant chemicals contained in the original plant. As such, it does not taste of anything and nor does it have any smell (the distinctive cannabis smell is a product of various chemicals in the plant, in particular terpenes and volatile sulphur compounds).

Being tasteless and odourless, CBD isolate works well as an additive to foods, drinks and cosmetics. Being completely pure CBD, it may not be as effective as full- and broad-spectrum CBD which, having a range of the original plant's accompanying chemicals, benefit from the entourage effect that many proponents argue is an essential element of the beneficial effects of CBD. However, for people who must ensure that no trace of THC enters their bloodstream – athletes being tested for performance-enhancing drugs for instance – CBD isolate is a safe alternative to full-spectrum CBD.

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HOW CBD CAN CHANGE YOUR LIFE

The supplement that can have a positive effect on mind, body and soul

WORDS BY **JAMIE FRIER**

For many people, it might seem as though CBD is a fairly recent innovation, but that is far from true.

Cannabis has been used for therapeutic and medicinal reasons for over 4,000 years. However, it was only in 1940 that cannabidiol (CBD), one of the two major components of cannabis, was successfully extracted and isolated from the plant. Cannabis was somewhat demonised by Western governments, and it took more than 20 years for CBD and tetrahydrocannabinol (THC), the other major compound of cannabis, to be synthesised and tested. THC was quickly identified as the psychoactive compound and was therefore the one that became the focus for users, scientists and lawmakers.

With cannabis being illegal in many countries around the world due to its hallucinogenic properties and potentially harmful side effects, clinical trials began to turn their focus back to CBD. Given that it is THC that contains the psychoactive element of marijuana, people began to wonder whether the other major compound, CBD, could provide the positives without the negatives.

Firstly, it's important to understand the difference between THC and CBD. Messages are sent around the body via neurotransmitters, some of which instruct the production of certain chemicals for certain reasons, for example, pain relief. When enough messages have been sent, biochemicals called endocannabinoids interact with cannabinoid receptors called CR1 and CR2 in your body's endocannabinoid system (ECS) to tell them to stop sending neurotransmitters. THC is able to bind itself to those receptors, blocking the endocannabinoids from carrying out their task. This means the body continues to get flooded with neurotransmitters and information, creating the 'high' that marijuana has become known for. This is where CBD comes in. It has a crucial role in

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limiting the impact of the THC on the receptor. If you think of marijuana as a cocktail, THC is the alcohol, while CBD is the mixer and fruit.

However, CBD has another effect, which is what makes it so useful as a product in its own right. Instead of blocking the receptors, it acts as a parachute on the endocannabinoid, slowing down the speed with which it interacts with the receptor and how quickly it dissipates back into the body. This means that the neural messages can continue to be sent for a little while longer, but the endocannabinoid isn't entirely prevented from doing its job and eventually everything returns to normal.

The overall effect of CBD is that it gives you certain benefits associated with marijuana, such as a happy feeling and temporary pain relief, but unlike THC, it doesn't attack your body's natural rhythm with the same rigour and isn't addictive. The out-of-body experience that puts users at risk and the potential mental health issues only occur because of the THC. By isolating the CBD element of marijuana, researchers managed to create a product that gives tangible benefits without putting the user in any kind of present or future danger.

The discovery that CBD gives users effective pain relief and relaxation without the 'high' and side effects prompted many authorities around the globe to re-examine whether CBD should be legal. Countries such as the UK and USA legalised the usage of CBD as long as it came from the hemp plant (rather than the cannabis plant), contained minimal amounts of THC and was used for medicinal, rather than recreational, purposes.

So as CBD became legal and companies started being able to produce, market and sell it, people became more aware of it as a genuine alternative to traditional painkillers, medicines and recreational drugs. It now comes in many forms, including pills, gummies, oil and creams, each providing different levels of benefit and convenience.

There are many reasons why someone would take CBD, ranging from the management of chronic pain and sleeplessness to wanting better-looking skin. It can be taken as part of a regular medication routine, or just whenever it is required to deal with the flare-up of a condition. In some places, it is something that can be bought over the counter, providing swift access to pain relief without having to

"THE PRESENCE OF CBD CAN REDUCE THE AMOUNT OF PAIN WE FEEL"

get a prescription, something that can take days or even weeks to arrange.

As a product that is derived from a natural source – the hemp plant – many people prefer to use CBD instead of a manufactured pill or powder. CBD isn't entirely free from side effects, though. It can result in fatigue, blood-thinning and nausea, but these side effects could well be less than a non-naturally occurring medicine. What you put into your body is a matter of trust and something like CBD can be much more trustworthy than something with a lot of chemicals and unfamiliar names in the ingredients list.

So what does CBD actually do for you? One major usage is pain management. Instead of taking drugs such as paracetamol, many people turn to CBD to alleviate the agony of chronic conditions, such as arthritis or inflamed joints. Pain inside the body occurs when something somewhere is being irritated, often because something is in the wrong place or your body's natural cushioning has worn away. Receptors within your body notice something isn't right and will create a reaction to help rectify this, such as swelling, or sending signals that manifest as either a sharp, shooting pain or dull ache. While CBD can't attach itself well to CR1 and CR2 receptors, it can attach itself to the TRPV1 receptors, which are linked to the way we feel pain. By reducing the sensitivity of these receptors, the presence of CBD can reduce the amount of pain we feel, leading to essential relief for those who suffer from a variety of ailments. The presence of CBD can also help to reduce inflammation, as it has anti-inflammatory properties. So not only does it block out the feeling of pain, it will also work to remove one of the elements that could be causing further discomfort.

CBD has also been shown to help people manage serious conditions, including epilepsy,

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"CBD IS A USEFUL COMPANION TO THOSE WISHING TO CONTROL THEIR ANXIETY LEVELS"

multiple sclerosis, Parkinson's disease and even cancer. Taking CBD won't cure these conditions, but they can help manage many of the associated symptoms.

Heart health can also be improved by taking CBD. Several studies have looked at whether CBD can lower blood pressure and it has been discovered that the right dosage does indeed lower it, while also improving blood flow and arterial health. Those that suffer from high blood pressure may want to consider adding a CBD supplement to their routine.

There is also the mental side of your health to consider. CBD is able to attach itself to receptors in the brain's limbic system, which is the area that controls memory and emotions. When overactive, the limbic system can cause spikes, resulting in anxiety or panic attacks. The presence of CBD can calm the limbic system by blocking receptors, so that your brain is put into more of a relaxed state. This should have the effect of reducing anxious feelings, so CBD is a useful companion to those wishing to control their anxiety levels. However, a word of caution. If you have been diagnosed with anxiety, depression or a mental illness, ensure you visit a doctor and get the appropriate help and support. CBD is not a substitute for medical help or prescribed medication and should only be used as an extra aid to managing medical conditions.

The same mechanism that helps manage anxiety can also aid those who struggle with sleep. If your brain is whirring away with thoughts, feelings, worries or fears, you could find it difficult to drop off. With CBD blocking the limbic system, your brain should be much more amenable to settling down for a good night's sleep. Studies have also shown that taking CBD can reduce the frequency and severity of nightmares, which could also be affecting sleep, as well as helping to regulate your body's circadian rhythm. These two benefits could be the secret to a good, deep, restful sleep that is all too rare for many of us.

CBD has also been found to work well with the hypothalamus, which is part of

the limbic system. This is the part of the brain that regulates temperature and we all know that you need to be at a comfortable temperature to go to sleep. By reducing thoughts, stress and getting your body temperature right, CBD is certainly something to consider for insomniacs. As mentioned earlier, CBD does not have the same psychoactive properties of THC and marijuana, so a gummy or dosage of oil around an hour before going to bed ought to prove a useful night-time companion without the risk of disturbing dreams.

Talking of THC's addictive, high-inducing effect, it is somewhat ironic that one of the two major compounds in marijuana can actually help battle drug dependency. It has been found that people who have an addiction to heroin can find their cravings reduced when on a course of CBD, as well as settling their resting heart rate. This could prove crucial in helping people off drugs in a slow, natural way, rather than going to rehab or cold turkey.

It's not just your insides that CBD can help, either. Pharmaceutical companies are rapidly increasing their range of skin creams that contain CBD. This is because of the compound's anti-inflammatory properties. With the CBD naturally reducing signs of swelling and the cream moisturising the affected area, CBD has been found to help those suffering with eczema and psoriasis. Anyone who has had either of these conditions knows just how irritating and painful it can be, and that simple creams don't last that long. However, the addition of CBD could help keep inflammation at bay and the itch relief lasting much longer. This anti-inflammatory property is also the reason CBD is increasingly being added to suncreams, reducing any redness from spending too long tanning on the beach.

Another ailment that this miracle compound could be effective at treating is acne. Research has shown that CBD reacts with the receptors on oil-producing glands, reducing the amount they produce. The less oil on your skin, the less chance of spots. Not only that, but the cannabis plant has been shown to have anti-bacterial and anti-fungal properties, further reducing the chances of your skin coming out in zits.

As previously mentioned, if you have medical issues, CBD should not be your only port of call. Always seek advice from your doctor about mental and physical conditions and check whether CBD is right for you. It can react with medication you're taking, which could lead to drowsiness, nausea or the prescribed medication not working at intended, so ensure your doctor approves, regulates and advises you on the right amount of CBD you can take.

CBD is non-addictive and doesn't make you high, which are two of the features that makes it preferable to cannabis for those with medical needs. However, the effect it does have – improving sleep, reducing pain, helping manage symptoms of illnesses – can become something you don't want to do without. Therefore you'll need to keep a handle on your usage to make sure it never gets out of hand and continues to be the natural, effective product that it is. While there does remain some element of stigma around CBD, as people associate it with cannabis or marijuana and believe anyone who takes it could be getting high, the more research that's done and the more people learn about the benefits while understanding the side effects, the more it will become mainstream and people can make the most of it without experiencing judgement.

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MYTHS SURROUNDING CBD

For many, CBD is shrouded in mystery,
but the truth is perfectly straightforward

1 MYTH CBD is addictive

REALITY There is no addictive element found in CBD. Of the two main compounds in the cannabis plant, THC is the one that attaches itself to receptors in the endocannabinoid system. This means that the more someone uses marijuana, the less their brain produces the neurotransmitters that send and stop information. This is because it is expecting the THC to do its job for it. Therefore, the user experiences withdrawal symptoms due to a lack of neurotransmitters that can only be sated by using more marijuana and THC.

However, since CBD doesn't attach itself to receptors, it doesn't have the same effect – the brain continues to act as normal and users don't build up a dependence on it. The pain relief that CBD provides can become relied upon, but the substance itself isn't addictive.

2 MYTH CBD gets you high

REALITY As with the addictive myth, the claim that CBD can get you high is due to people attaching the effect of THC onto CBD. It is THC that has the psychoactive element and attaches itself to receptors, which is what results in the feeling of being high. CBD does not have a psychoactive effect and works in a different way, limiting the degradation of endocannabinoids rather than disrupting the system itself.

This means that CBD acts in no different a way than any other pain relief on the market, none of which result in a high, and is therefore safe to use as part of normal self-medication. It is merely the fact that it comes from the cannabis plant that makes people think it'll give you that marijuana buzz.

3 MYTH CBD hasn't been researched

REALITY For a long time, CBD had been left alone while people either studied the effects of THC or worked hard to keep cannabis and cannabis-related products illegal and difficult to obtain. However, once it was noted that it didn't result in highs or psychosis, top global universities, such as Harvard and Oxford, and laboratories studied CBD in clinical trials to discover its pros and cons. The result of this was that the Food and Drug Administration (FDA) in the USA approved a medication containing CBD to treat epilepsy and many other countries around the world have tentatively legalised CBD products.

> "TOP GLOBAL UNIVERSITIES AND LABORATORIES STUDIED CBD IN CLINICAL TRIALS"

Given the public perception of drugs, there is no way governments would have legalised these products without being sure they're safe. Studies continue to discover more properties of CBD, but enough is known to confidently hold up its use for effective pain, anxiety and seizure management.

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4 *MYTH* If it's on sale it's good for you

REALITY A word of warning has to be given for anyone buying CBD products. Just because something is being legally and legitimately sold in shops or online, it doesn't mean it's going to work miracles. CBD products are legal in many countries, provided they only contain a trace of THC and come from the hemp plant. The regulations don't say how much CBD has to be in it. So whenever you're buying a bottle of CBD gummies or oil, make sure you check the label so you know how much of the good stuff is in it. Some manufacturers only put in a trace of CBD so it can be sold as such and it ends up doing nothing for you. CBD is a wonderful product, so don't waste your money on something that doesn't contain an effective amount.

5 *MYTH* CBD has no side effects

REALITY While it's true that CBD doesn't contain the addictive properties of other pain medication, it's not completely free from side effects. It can result in anything from nausea to fatigue and users should be aware of this when considering it as a medical care option.

On that subject, given that CBD shouldn't be used as the sole medication for managing some conditions, be aware that it can react with other medication, such as blood thinners, and have a negative effect on your health and the medicine you're taking. With this in mind, always make sure your doctor knows you're taking or planning to take CBD so they can make an informed decision over any treatment or medication you need. CBD by itself is a useful product but, as with any supplement, needs to be carefully managed.

Image Getty

2

DOSING

In this section, understand how the law perceives cannabidiol across the world, learn the different ways to consume CBD and how to work out your ideal dose

7 WAYS TO TAKE CBD

Getting the best out of CBD is all about finding the right method and dosage for you. Everyone is CBDifferent!

WORDS BY **PETE WISE**

① OIL

CBD oil has consistently been one of the UK's favourite ways to take CBD, ever since the legalisation of CBD products in 2018. The oil is made by diluting pure CBD extract in a 'carrier', such as coconut oil or olive oil, which makes the CBD safe and easy to consume.

Using a dropper, you place a dose of the oil under your tongue, where it can enter the bloodstream within a few minutes. The taste can be quite unpleasant, but the process is quick and effective – even if you're taking a relatively high dosage.

Because CBD oil absorbs directly into the capillaries under the tongue, it bypasses the metabolism. This means your body is likely to absorb a consistent level of CBD each time you take the oil, with no irregularities resulting from digestion. However, do be careful when administering CBD oil with a pipette dropper, as it's quite easy to squeeze out too much oil (or too little).

② CAPSULES & TABLETS

CBD capsules and tablets are much like the vitamin supplements and painkillers most of us have at home. Their familiar form (whether it's a solid tablet or a capsule) makes this type of CBD product approachable and easy to take – especially if you're a first-time user.

Another advantage to CBD capsules and tablets is that they provide a very precise dose of cannabinoid, eg 15mg or 25mg per capsule. They are discreet, easy to take on-the-go, and free from the off-putting flavour associated with CBD oils.

The downside to taking CBD as a capsule or pill is that it's hard to predict how much of the active ingredient will actually enter your bloodstream and provide beneficial effects. Different people absorb varying amounts of the CBD into their body, depending on how their metabolism interacts with the drug. So, capsules and tablets make it easy to take CBD – but they might not deliver the full potential of the compound.

> "THEY ARE FREE FROM THE OFF-PUTTING FLAVOUR OF OIL"

③ GUMMIES

A gummy sweet full of sugar helps the medicine go down. That's the basic idea behind CBD gummies: chewy, flavoured sweets containing CBD extract.

CBD gummies are perhaps the most pleasant type of CBD product to take. You eat them like you'd eat any other gummy sweet (except you're paying much closer attention to how many you munch).

There are many different flavours, shapes and textures of CBD gummy available – from fruit-flavoured gummy bears to CBD cola bottles. The gummies also vary in strength, ranging from about 5mg to 25mg of CBD per sweet. Vegan options are available.

While CBD gummies are easy to consume (and sometimes tasty), there are potential downsides to this method of taking CBD. Some of the CBD from the gummies will inevitably be wasted through metabolic processes, which means the body can only use some of the dose contained in the gummy. Nonetheless, CBD gummies can become a great way to take CBD, once you've worked out the ideal dosage for your body.

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4 BALMS

If you're suffering from aches and pains, or if you have dry or irritated skin, you might consider using a CBD balm to ease your symptoms.

Often combining CBD extract with other organic ingredients, CBD balms can be applied directly to afflicted parts of the body. The CBD soaks into the skin and – according to many CBD brands and users – reduces pain, discomfort and inflammation.

Bear in mind that CBD balms do not typically deliver CBD into the bloodstream, which means this method is unlikely to provide the same benefits as using a CBD oil or CBD gummies, for example. On the plus side, there's no need to worry about your dosage.

When using a CBD balm, it's important to check the instructions and identify any parts of the body where the product should not be used. In almost all cases, you should avoid ingesting the balm or using it around your eyes.

> "CONSIDER CBD BALM TO EASE YOUR SYMPTOMS"

5 ORAL SPRAYS

A CBD oral spray is essentially a bottle of CBD oil that is administered via a spray nozzle, rather than a dropper. The spray is made with a combination of CBD extract and a carrier oil, and it can enter the bloodstream directly via capillaries in the mouth.

If applied correctly, an oral spray can be a highly effective method for taking CBD. This usually means spraying the product under your tongue or onto the inside of a cheek. The CBD is absorbed directly into the bloodstream, providing a very good rate of activation relative to the amount of CBD that has been ingested.

Human error is the biggest potential obstacle to the effectiveness of a good-quality CBD oral spray. It's important to follow the maker's instructions, and aim the spray at the specified parts of the mouth.

Many CBD oral sprays are available in fruity flavours that make the CBD more palatable. In some cases, a CBD spray might even double up as a decent breath freshener!

6 DRINKS

You can now get your daily dosage of CBD from a huge variety of drinks, including seltzers, flavoured waters, teas and coffees.

A nice-tasting CBD drink is surely one of the most pleasant ways to ingest CBD. There are some delicious options out there, for example the TRIP sparkling drinks, now sold at mainstream chains such as Sainsburys and Holland & Barrett.

Customer feedback on the effects of CBD drinks varies between brands and beverage types. A CBD oil or spray would usually deliver a higher rate of CBD absorption into the bloodstream than a beverage, but many popular CBD drinks do seem to provide beneficial effects after a short delay.

7 FOOD ENHANCERS

A CBD food enhancer is a liquid supplement that can be added to any meal or drink. Simply apply a drop of the supplement to your food, and you can incorporate your daily dosage of CBD into your lifestyle with hardly any effort.

Similar to CBD oils and sprays, most CBD food enhancers are a mixture of CBD extract with a carrier oil. Some also contain added dietary supplements.

Because food enhancers pass through the metabolism, they don't provide the same reliable absorption into the bloodstream as a CBD oil or spray. Nevertheless, they're an incredibly convenient method for taking CBD.

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HOW TO WORK CBD INTO YOUR LIFE

It takes a little time and experimentation to find the perfect CBD products, dosage, and routine for you

WORDS BY **PETE WISE**

One of the great things about CBD is that it can play various different roles in a person's life. You can use it as an occasional pick-me-up, a daily supplement, or an 'as-and-when' remedy for acute issues ranging from anxiety to difficulty with sleep.

However you choose to use CBD, you'll need to find the dosage that delivers the best effects for you. Identifying the highest possible dosage you could take is easy, as the maximum dosage of any CBD product should be stated clearly on the packaging – whether you're using a CBD oil, capsules,

gummies, or something else. No matter how well your body tolerates CBD, you should never exceed the maximum dosage stated for the products you use.

It's natural to hope for a big, immediate, therapeutic effect from CBD – especially if your aim is to relieve a symptom. However, that doesn't mean you should take a high dosage straight away. Everyone responds differently to CBD, and for some users, taking too much of the drug will lead to unpleasant, off-putting side effects. The most reliable way to achieve the good effect you're aiming for is to build up gradually to your ideal dosage.

At first, take only mild doses of CBD. Factors including a person's body mass and metabolism usually affect how strongly they feel the effects of CBD, so your 'mild dose' could be anywhere from about 5mg per day to over 22mg, depending on your biology.

From the very first time you take CBD, start taking note of any positive or negative effects. If you want to be really thorough, write your thoughts down in a journal. One dose at a time, you can gradually increase your dosage, while continuing to record how the CBD affects your mind and body.

It can be difficult to tell exactly when you've reached the dosage where CBD works at its best for you. The challenge is to find your 'sweet spot' – a dose of CBD that gives you beneficial effects, without causing strong side effects that affect your lifestyle or harm your health. Ask yourself, at what dosage did you experience the strongest positive effects, relative to any negative side effects?

Some users do experience undesirable side effects after taking CBD, and these may become more severe when a higher dose is taken. Common complaints associated with CBD products include drowsiness, fatigue, digestive problems and loss of appetite. With these risks in mind, it might be better to take a smaller dose of CBD that gives partial relief, rather than taking a larger dose that provides more relief but also has stronger side effects. Any pleasant effects or relief from symptoms can be considered a success.

In order to work CBD into your life effectively, you'll need to choose one or more CBD products that fit your preferences, lifestyle, mind and body. CBD oils, capsules, gummies, balms, oral sprays, drinks and food enhancers all have their own characteristics, and you may end up trying a few options that disagree with you, before you find the right one.

The type of CBD product you choose can greatly affect how well CBD fits into your life. Some of us prefer a pleasant and relaxing method of taking CBD, such as drinking CBD beverages,

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> "CBD OILS AND CBD SPRAYS TEND TO PROVIDE THE BEST RATES OF ACTIVATION"

or using CBD creams or balms to soothe aches and pains. These methods may not be the most reliable ways to activate CBD biochemically, but they can create positive experiences through scent, touch – and in the case of CBD drinks, taste. The enjoyment of a CBD product can make its own important contribution to your wellbeing.

Meanwhile, other users view CBD purely as a medication or health supplement. If this sounds like you, we'd recommend taking CBD in the form of a product that delivers CBD into the bloodstream at a very reliable rate. Taken sublingually (under the tongue), CBD oils and CBD sprays tend to provide the best rates of activation, relative to the dosage taken. Some users take a dose of CBD as often as two or three times a day. If you're going to be taking CBD frequently, you'll need to find a product that you find convenient to use on-the-go, perhaps a spray, capsule or tablet.

Another important detail to work out is when to take CBD. If you plan to use CBD routinely, you might find it helpful to set alarms to remind you to take a dose at your chosen times of day. As is true of many medications

KNOW YOUR DOSAGE

It's all about finding a safe dosage that delivers the desired effects

The label of any reputable CBD product will tell you how many milligrams of CBD are contained in each dose or serving, eg 15mg, or 500mg. By adding up the CBD content of all the doses you take in a day, you can work out your total daily dosage in milligrams. If you're only taking one dose per day, this should be an easy task!

It is important to bear in mind that repeat-use CBD products will also list the total content of CBD in the container, so it's essential to confirm that you're using the 'per dose' figure for your dosage calculation.

It's always a good idea to check the dosage of a new CBD product, because separate products that appear similar may have different maximum dosages. For instance, CBD oils vary in their concentration of CBD extract, and the amount of CBD in each drop varies accordingly.

Your daily dosage of CBD should never exceed the maximum dosage stated on the packaging or instructions for any CBD product. Users require wide-ranging dosages of CBD to meet their individual needs, based on factors such as their body weight, medical history and tolerance to CBD. Plus, treating some medical conditions will require more CBD than treating others.

For a simple dosage calculation starting point, CBD Guru has a free online calculator tool that uses your weight to work out your recommended low, medium or high dose of CBD oil:

www.cbd-guru.co.uk/cbd-dosage-calculator

and supplements, it's all too easy to miss a CBD dose. Occasional CBD users don't need to take such a regimented approach to planning their doses. However, it's always a good idea to think about which times of day are suitable for CBD use. Some users prefer to only take a dose at bedtime, because the CBD tends to make them feel drowsy or sleepy. These side effects could be problematic in situations during the day, where alertness is important, such as working or driving, but don't matter at night.

If you do experience any unwanted side effects after taking CBD, this may indicate that you need to change your approach. That could mean reducing your dosage, adjusting the timing of your doses, or switching to a different type of CBD product. If you have severe side effects, it's advisable to stop taking CBD, at least until you've consulted a doctor about your experience. All sorts of people report that CBD makes a positive difference to their wellbeing, but this cannabinoid is not for everyone. In fact, a small minority of people might even be allergic to CBD, due to its content of pollen and histamine from the hemp plant.

The good news is that many people develop a very positive relationship with CBD – especially after they've experimented with a few different methods and dosages. CBD can become a daily supplement that improves your wellbeing, a medicine-cabinet staple used to solve acute problems, or an occasional, feel-good pick-me-up. While you can't necessarily assume that CBD is going to work miracles, millions of users agree that it does enough good to outweigh any of the side effects or downsides they experience. This is the true CBD sweet spot you should be aiming for: an approach that benefits you, CBD products that suit your lifestyle, and a welcome gain in wellbeing.

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CBD AND THE LAW

The legal status of CBD products can be confusing – we aim to set things straight

WORDS BY **EDOARDO ALBERT**

Although CBD products have proliferated around the world over the last decade, their exact status under the law is often not very clear. The main reason for this is that the law regarding CBD products is itself somewhat opaque, inhabiting a grey area between foods, medicines and drugs. This is mainly an issue for producers and retailers of CBD products – as a customer you are extremely unlikely to face any consequences beyond confiscation from buying a CBD product that falls foul of the laws in this area. However, it is still best to know if what you are buying is legal in your country.

But before we try to untangle the knots of CBD legislation around the world, let's look at the history of how we got here and why the law has become so complicated on this issue.

Cannabis falls foul of the law

Cannabis is a fast-growing annual plant that produces fibres ideal for making cloth and rope. As hemp, it became a vital raw material for the Age of Sail, so much so that Henry VIII required landowners to grow the plant. Indeed, Jack Tar, the slang term for English sailors, came from the practice of tarring hemp ropes to ensure they did not rot. Because hemp has very low levels of tetrahydrocannabinol (THC), which is the psychoactive component of cannabis, it is very unlikely that the sailors of the Royal Navy spent their time off duty getting stoned: rum was far more their drug of choice.

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"ALL THE RESEARCH INDICATES THAT CBD IS NOT HARMFUL AND DOES NOT PRODUCE A HIGH"

However, varieties of cannabis with higher THC content were common in Asia and as British interests grew in India, these varieties began to be imported to Britain and Europe. As did another potent plant-based drug: opium. By the end of the 19th century and at the start of the 20th century, concerns were growing about opioid drugs and cannabis, also being a plant-based drug, was included in this group of worrisome drugs. Following the hiatus imposed by World War I, the United Kingdom passed the Dangerous Drugs Act in 1920, prohibiting opium, morphine, heroin and cocaine. Cannabis was not on the list of prohibited drugs but following the International Opium Convention in 1925, cannabis was added to the list of dangerous drugs and prohibited.

In 1971, the Misuse of Drugs Act legislated for three classes of prohibited drugs, ranging from class A drugs (including heroin, cocaine and LSD), class B (including cannabis, amphetamines and barbiturates) and class C drugs (including benzodiazepines and anabolic steroids). In 2004, cannabis was moved down to a class C drug but in 2009, it was put back in class B. Penalties for possession of a class B drug can rise as high as three months imprisonment and a £2,500 fine in a magistrates' court, while if the case goes to Crown Court, the penalties can rise to five years in prison and an unlimited fine. With the penalties still potentially severe for the possession of cannabis, it makes sense to understand where the law draws the line between cannabis use and CBD products.

CBD in British law

CBD is one of the cannabinoid compounds that occur naturally in the cannabis plant. THC is another major cannabinoid in the cannabis plant. As already mentioned, this is the chemical that produces the cannabis high and it is also the source of the legal difficulties with the plant.

All the research indicates that CBD is not harmful and does not produce any sort of high. In fact the opposite is true – it appears to act as a counterbalance to THC. It has been discovered that cannabis with a high level of CBD is actually a less potent drug than cannabis with a low CBD content. But given that both cannabinoids are present in all varieties of cannabis plant, even if the THC quantities are very low, the legal problem lies in defining how much THC CBD products can contain.

Under current British law, CBD products are considered legal if they contain less than 1mg of THC. You will also see sites saying that CBD products are legal as long as they contain less than 0.2 percent THC. Strictly speaking, this applies to the amount of THC present in the varieties of cannabis (usually called industrial hemp to remove the drug stigma) that can be cultivated for legal use in the UK.

In practice, though, there is little difference between the two limits.

While products sold in Britain will adhere to these limits, it's important to check the THC content of any CBD products that you order from abroad. These could have different limits to their THC content and customs may seize and destroy any products that exceed the domestic limits of THC content.

The other key aspect of British law with respect to CBD products covers how they are marketed. As yet, their medicinal properties have not been fully tested and agreed upon, so it is illegal to sell any CBD product as a medicine or as having medical benefits.

Instead, CBD products come under the novel food guidelines of the Food Standards Agency and are regarded as food supplements. Novel foods refer to foodstuffs that were not widely consumed in the UK before 15 May 1997. Since CBD has only quite recently become available as a separate food, it comes under the remit of this legislation. To ensure the safety of novel foods, manufacturers have to submit each new product for assessment under criteria that include evaluating for safety and the accuracy of the information about the food.

Although it is legal to buy CBD products in the UK (so long as they don't contain more than 1mg of THC), it remains illegal to grow cannabis, even the low-THC hemp variety, for personal use. It is also illegal to sell the flowers of hemp plants because this is where the cannabinoids are concentrated.

Medicinal cannabis

It is now clear that cannabis can have medicinal benefits for people suffering from multiple sclerosis (MS) and some rare forms of epilepsy, as well as helping with the nausea and vomiting associated with chemotherapy. However, the treatment in the UK is only available by prescription and only when no other treatment has worked. This means that in reality, few people will be prescribed medicinal cannabis under the current law and those that do receive it will be having enough to deal with medically to not be concerned about the pros and cons of using CBD.

CBD in Australia

The Australian approach has been almost the exact opposite. Cannabis has been available as a prescription drug for doctors since 1967 and may be prescribed for any condition for which the doctor considers it to be useful. On 1 February 2021, the Therapeutic Goods Administration in Australia moved low-THC CBD oil from Schedule 4 (by prescription only) to Schedule 3 (from a chemist). However, in

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> "IT'S LEGAL IN PRINCIPLE TO BUY CBD PRODUCTS BUT AS YET, IMPOSSIBLE IN PRACTICE"

Australia, CBD products continue to be considered as medicinal, which means that a much more stringent testing regime is in place. Manufacturers have to demonstrate that what they want to sell has definite medical benefits, which means thorough, not to say long-winded and expensive, tests before any product can come to market. The upshot of this is that while low-THC CBD oil is theoretically legal in Australia, no manufacturer has yet been able to demonstrate the specific medicinal benefits necessary in order to put their product on the market. So in Australia, it's legal in principle to buy CBD products but as yet, impossible in practice.

CBD and the EU

The novel foods regulations under which Britain regulates CBD products was Europe-wide when promulgated in 1997 and still holds force in the European Union. The exact legal status of CBD products varies according to the local laws in each country but the usual regulations concerning novel foods apply across the EU. However, as of 2022, the European Food Safety Authority (EFSA) has decided to pause all new applications for novel food licences containing CBD while it makes further investigations into any possible adverse effects of CBD. There are 19 applications currently on hold while the EFSA continues its tests. The EFSA has stated that such a pause is normal when introducing novel foods on the market, so there's no reason to assume that the tests will reveal anything untoward.

On 1 January 2023, the new EU Common Agricultural Policy mandated that the THC limit for hemp imported to or grown in the EU could be 0.3 percent, up from the previous 0.2 percent. Now to take a closer look at the status of CBD products in some of the major EU countries:

- **FRANCE** As long as the THC content is below 0.3 percent, CBD products are legal.

- **GERMANY** Currently unclear. CBD products were supposed to be legal as long as the THC content was less than 0.2 percent but in October 2022, the Federal

Court of Justice found two men guilty of selling 60 kilograms of hemp to a wholesaler despite it having less than 0.2 percent THC. The court decided that the hemp should be regarded as a drug. The German government has proposed a new law definitively stating that hemp with less than 0.3 percent THC should not be treated as a drug. The situation is unsettled, so it is best to always check for the latest information.

- **GREECE** CBD products are legal as long as the THC content does not exceed 0.2 percent at any point during the production.

- **IRELAND** In 2022, the High Court stood firm that the presence of any amount of THC in a CBD product means that it should be regarded as a drug and therefore remain illegal. So at present only CBD products entirely free from any trace of THC can be bought or sold in Ireland.

- **ITALY** Italy has a somewhat more liberal regime than many other countries, allowing CBD products on the condition that the THC content does not exceed 0.6 percent during the manufacturing process.

- **THE NETHERLANDS** Bizarrely, while cannabis has long been decriminalised and is widely available in Holland, CBD products remain technically illegal as the law does not allow cannabinoids to be extracted from the cannabis plant. Although this remains the law in the Netherlands, CBD products with less than 0.05 percent THC are still widely available and are accepted by the government.

- **POLAND** CBD products are legal if the THC content does not exceed 0.3 percent.

- **PORTUGAL** While the recreational use of cannabis has been decriminalised in Portugal, CBD products, regarded as medicines, can only be obtained via a doctor's prescription.

- **SPAIN** Although growing cannabis for one's own use is legal in Spain, CBD products cannot be sold for consumption but they can be sold under the label of cosmetics, and must remain under 0.2 percent THC.

- **SWEDEN** Only CBD products completely free from THC are legal in Sweden.

CBD & UNCLE SAM

The CBD situation in America is a complicated one

If we take Uncle Sam to represent the federal authorities, then CBD products with less than 0.3 percent THC are legal in the US. Unfortunately, that doesn't translate to the individual states, each of which has its own set of rules for CBD products. As such, it's important to check the rules both in the state where you are living or visiting, but also in any other states that you plan to visit. At the time of writing, CBD products with less than 0.3 percent THC were legal in the following states:

- **Alaska**
- **Arizona**
- **California**
- **Colorado**
- **Connecticut**
- **District of Columbia**
- **Illinois**
- **Maine**
- **Massachusetts (for adults over 21)**
- **Michigan**
- **Montana**
- **Nevada**
- **New Jersey**
- **New York**
- **Oregon**
- **Vermont**
- **Virginia**
- **Washington**

In all other states, check the relevant local laws.

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HEALTH

From chemotherapy and chronic pain to insomnia and anxiety, CBD can help ease your symptoms, meaning you can live your life without fear of a flare-up

WHAT IS CBD GOOD FOR?

CBD is claimed to help a wide variety of conditions. We evaluate the evidence

WORDS BY **EDOARDO ALBERT**

Cannabis sativa is one of the oldest cultivated plants in the world. Spreading from its botanical origin on the Tibetan plateau, it has been grown through much of Asia, the Middle East and Europe, and made its arrival in Africa sometime around 1000 CE. Not being native to the Americas, the plant was introduced there by European explorers – either Spanish or Christopher Columbus – in 1492.

The plant's spread was down to its utility: people grew it because they could use it. Its usefulness rests upon two planks: the fibres of the hemp varieties that produced perhaps the first cloth, and the chemicals of the medicinal varieties, that have been used for medical and religious purposes for just as long.

Many of the great ancient civilisations employed cannabis as a drug, including the Egyptians, the Sumerians, the Romans and the Persians. Among the ailments it was used to treat were seizures, eye problems and melancholy.

Traditional ayurvedic medicine in India and Sri Lanka has long made use of the medicinal properties of cannabis, employing it as a herb to treat disorders including fevers, anxiety, asthma, seizures and various skin problems, and continues to do so.

In many countries today, some of the derivatives of the cannabis plant – in particular CBD – are beginning to be used again for medicinal purposes. The

proponents of the medical benefits of CBD and cannabis have touted it as beneficial for a wide range of disorders. However, it's important to note that, to date, medical cannabis is only available in the United Kingdom for three specific conditions: some rare forms of epilepsy; chemotherapy-induced vomiting and nausea; and spasms and muscle stiffness caused by multiple sclerosis. In these cases, it has to be prescribed by a doctor and only after other forms of treatment have failed.

These are treatments that have been through rigorous medical testing, including double-blind trials, and which have shown significant clinical benefits and few side effects. Hence, they are now available as medical treatments. Outside this small group of drugs, the various touted health benefits of CBD and cannabis have yet to pass clinical testing. This is why it is illegal to sell CBD in the United Kingdom and other countries as a medicine: it is marketed as a food supplement. Now, obviously, foods have health benefits – if we don't eat we die – but they are not, strictly speaking, medicines. While many people are willing to attest to the health benefits of CBD, these testimonies are anecdotal and they do not count as a proper clinical trial.

However, proponents of the benefits of CBD assert that one of the problems of running full-blown clinical trials on CBD and cannabis-derived products, is that they function differently from standard drugs. Clinical trials use a chemically pure form of the drug and test that, working on the assumption that it's only this particular chemical that produces the effect. Plant-based medicines, though, have a whole raft of ancillary compounds that accompany the main drug. Advocates of the medical benefits of CBD often argue that CBD works much better when it is used with its accompanying suite of chemicals derived from the cannabis plant, claiming that the different compounds work in synergy to produce their effect. This synergy effect makes it much more difficult to conduct traditional clinical trials, as these usually exclude the other cannabis compounds as confounding factors. Nonetheless, many, many people have reported experiencing profound improvements in their health having taken CBD. In the following pages, we look at some of the disorders that CBD is thought to help.

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MULTIPLE SCLEROSIS

A medicinal cannabis derivative, Sativex, has been approved as an MS drug

Multiple sclerosis (MS) is cruel. It affects the brain and nervous system, causing a wide range of symptoms that, because of their sheer range, can often be mistaken for something else. In the early stages, symptoms can include fatigue, problems with balance, pins and needles and numbness, loss of concentration and problems with eyesight. All of these have many other possible causes apart from MS. But as the disease progresses, its symptoms worsen so that sufferers from advanced MS may experience muscle spasms and spasticity, severe pain, endure difficulties in speaking and swallowing, and suffer from bladder problems. MS in its final stage can produce paralysis and the inability to speak or swallow, leaving the patient requiring constant care.

As a disorder, MS is a disease of the autoimmune system and a degenerative brain disease. As an autoimmune disease, the body attacks itself, in particular the myelin sheath that surround nerve fibres. When attacked by the immune system, the myelin sheath becomes inflamed, which can lead to injury to the nerve itself. However, the disease can also be viewed as neurodegenerative, with the myelin sheath protecting nerves breaking down, leaving the underlying nerve fibres exposed. The disease has more and less aggressive forms: in some cases it can proceed very rapidly, in other cases, it might remain stable for many years.

Among MS sufferers there has long been anecdotal evidence that cannabis could be helpful in alleviating some symptoms, in particular muscle spasms and spasticity, and pain. Indeed, the MS Society, surveying its members, found that 20 percent had used cannabis to help with symptom reduction in 2014.

Clinical trials have indeed proved the efficacy of cannabis for these MS symptoms and in the UK, the drug Sativex has been approved for use to help people suffering from moderate to severe spasticity. However, Sativex can only be prescribed once other treatments have failed and, according to the MS Society, relatively few people have yet benefited from it. Sativex is an oral spray that contains a 50:50 mixture of THC and CBD (so a vastly higher amount of THC than is found in over-the-counter CBD products). It is not effective for all MS sufferers but about 70 percent do see a reduction in symptom severity. While Sativex is only licensed as a treatment for spasms and spasticity, users have reported it as also being helpful in alleviating pain and bladder problems.

Given the difficulties in being prescribed Sativex, many MS sufferers, particularly those in the earlier stages of the disease, have turned to using CBD products to help with their symptoms. We know that CBD acts through the body's endocannabinoid system, which is an important regulator of inflammation, the immune system, pain and motor control – all of which are key symptoms of MS. Given the effects of CBD on the endocannabinoid system, it's not surprising that MS sufferers have started using CBD to try to manage their symptoms.

Research into exactly how CBD can help MS sufferers is still in its early stages and, like other research in this area, has been hampered by the difficulties involving medical research on cannabis as a proscribed drug.

Its effects probably proceed through its interaction with the body's endocannabinoid system. CBD helps to regulate the CB1 and CB2 receptors that are key

Image Getty

parts of the endocannabinoid system, helping to maintain system balance. As such, CBD acts as an anti-inflammatory, which probably helps reduce the inflammation that degrades the myelin sheath around nerve fibres. Since inflammation is one of the key drivers towards worsening symptoms in MS, controlling inflammation is profoundly helpful.

Most of the research into MS and cannabis has concentrated on the effects of Sativex rather than CBD products. So the reports of the usefulness of CBD products remain anecdotal. However, MS sufferers who have found CBD useful often report that it has helped with pain relief without having the side effects that come from using opioid pain killers. Given the individuality of patients and differences in the progress and severity of the disease, people using CBD to self-treat generally proceed by trial and error, experimenting with different dosages and times to take CBD to ascertain what brings the best results for them as individuals.

> "RESEARCH INTO EXACTLY HOW CBD CAN HELP MS SUFFERERS IS STILL IN ITS EARLY STAGES"

CHEMOTHERAPY

Nabilone is a synthetic derivative of cannabis that is now available to help chemotherapy patients overcome nausea and vomiting

Cancer. It's the diagnosis none of us want to hear from our doctors. But, sadly, many people do learn that they have cancer at some point in their lives. However, cancer treatments have improved hugely over the last 50 years and many cancers that were incurable a few decades ago can now be successfully treated, particularly if caught early.

The improvement in cancer survival rates is down to the increased effectiveness of the whole suite of cancer treatments, from radiotherapy through to surgery, but in particular there have been huge advances in chemotherapy. However, a well-known and quite common side effect of various chemotherapies is what is known medically as chemotherapy-induced nausea and vomiting (CINV). While patients are often willing to endure these side effects in order to treat their cancers, they can become distressing and, in some cases, so debilitating that the patient decides to end the treatment. There are a raft of conventional anti-nausea treatments available but for a significant sub-section of patients, none of them prove to be effective.

> "A CANNABINOID HAS BEEN SHOWN TO HELP ALLEVIATE SIDE EFFECTS OF CHEMOTHERAPY"

However, with growing interest in the body's endocannabinoid system, researchers developed a new drug, Nabilone, that effectively prevents nausea and vomiting in chemotherapy patients. While Nabilone is a synthetic chemical, its structure mimics that of THC, the psychoactive part of cannabis. As we have already seen, THC can lock into the receptors of the body's endocannabinoid system, so this synthetic version of THC mimics its action in helping to suppress the side effects of chemotherapy.

While Nabilone is medically available in the United Kingdom, it has to be prescribed by a doctor and only after the other, more conventional, methods of treatment have been tried and found wanting. Nabilone is also available under prescription in the USA.

So while not the first port of call, a cannabinoid has been shown to help alleviate some side effects of chemotherapy. However, if you search online, you will see reports of people using CBD and various cannabis derivatives to treat their own cancers. In some cases, they even report almost miraculous cures. But this is a good time to emphasise that CBD is not a cure for cancer. It should never be used as a replacement for conventional cancer treatments.

Another important point to bear in mind for those people who try CBD and cannabis treatments to help with their cancers, is not to use the cannabis flowers as they may contain moulds or other biotoxins. Since many cancer patients have their immune systems suppressed, it is important to avoid any possibility of accidentally ingesting an infection.

Sativex, the 1:1 ration THC/CBD drug prescribed for some of the symptoms of MS, is also undergoing trials to see if it can be used for cancer treatment. A 2021 study found that, when prescribed with a chemotherapy drug, it produced a significantly higher survival rate after a year among cancer patients with a recurring form of brain tumour (glioblastoma) than the control group who were given a placebo. Researchers have now begun a much larger trial to test further the effectiveness of Sativex when used with chemotherapy drugs.

At the moment, there is insufficient evidence to say whether or not cannabinoids can be useful as anti-cancer treatments but research is ongoing in this area and, hopefully, we should know more in a few years.

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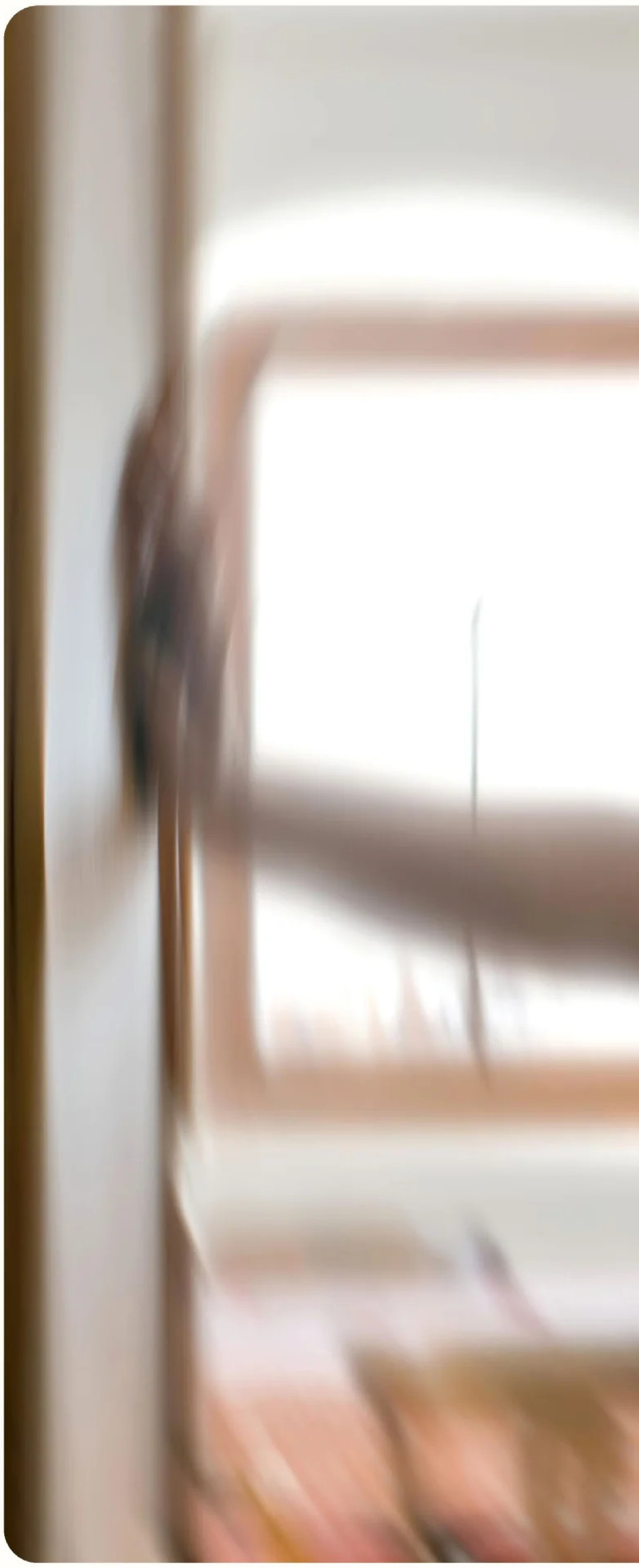
EPILEPSY

Epidyolex, an anti-seizure drug, now helps those with epilepsy lead more normal lives



According to the gold-standard of medical research, the randomised double-blind study, CBD works to reduce the seizure frequency in adults and children with two rare – but severe – forms of epilepsy, Dravet syndrome and Lennox-Gastaut syndrome. In these cases, the epileptics were often suffering multiple seizures every day while the standard anti-epilepsy drugs they were being prescribed, such as steroids, were being given in such huge doses in an effort to control the seizures that they were producing hideous side effects.

With there being anecdotal reports of cannabis-derived drugs proving helpful for the control of epilepsy, a proper clinical trial was authorised to test the effect of CBD oil on the prevention of seizures. The results were unequivocal, at least in the case of people suffering from Dravet and Lennox-Gastaut syndromes, seizures were reduced with relatively minor side effects.

As a result a clinical drug, known as Epidyolex, has been approved for the treatment of epilepsy sufferers in Britain, the EU, and America. However, it remains a prescription-only medicine and, in the UK, will only be prescribed when other treatments have failed. At the moment in England it can only be prescribed for people suffering from Dravet and Lennox-Gastaut syndromes. In Scotland and Wales, however, Epidyolex, which is basically pure CBD, has been approved as a treatment for tuberous sclerosis complex (TSC). TSC is a rare genetic disease that produces benign tumours in various parts of the body, including the brain. A common symptom of the disease is seizures. While health authorities in Scotland and Wales have approved Epidyolex as a treatment to control TSC seizures, in England the National Institute for Health and Care Excellence (NICE), in a November 2022 paper, decided that the drug would not be cost effective for the NHS. The TSC charity, the Tuberous Sclerosis Association, is campaigning to overturn that decision.

The use of CBD to treat epilepsy first came to widespread public attention in 2013, when the story of a young girl, Charlotte Figi, whose mother had treated her successfully with CBD oil, was the subject of a CNN documentary. Charlotte was born on 18 October 2006 and within three months had her first seizure. By the time she was five, she was having 300 seizures a week. Charlotte's mother, Paige Figi, reading the testimonies of people who had found CBD helpful in controlling seizures, procured oil from a variety of cannabis plant that was colloquially known as 'Hippie's disappointment' because it was so low in THC. The CBD derived from 'Hippie's disappointment' produced a dramatic reduction in Charlotte's seizures, down to two or three a month. When news of the effect of the treatment spread among parents of children with similarly debilitating epilepsy, some moved to Colorado to gain access to CBD. Charlotte's story featured on TV and magazines and provided vital impetus to the move, in the United States, towards the legalisation of medical marijuana. In honour of Charlotte, 'Hippie's disappointment' was renamed 'Charlotte's Web'. The story has a sad end, however. In April 2020, Charlotte contracted pneumonia, leading to renewed seizures and her death on 7 April. She was only 13. But CBD had given her eight years of relatively normal life after the nightmare of her early years.

> "IT'S NO SURPRISE THAT MANY EPILEPTICS HAVE TAKEN TO USING CBD THEMSELVES"

Given the demonstrated effect of Epidyolex on some forms of epilepsy and the many anecdotal accounts of CBD oil producing similar effects on other forms of epilepsy, it's no surprise that many epileptics have taken to using CBD themselves, either self-medicating or in conjunction with their doctors. While not yet definitively proven as being useful, enough epileptics have found CBD helpful to indicate that it would be worthy of further trials. While Epidyolex is pure CBD, without any THC or the other compounds found in the cannabis plant, some epileptics have reported even better results when using full-spectrum CBD oil, which is oil that in addition to CBD, contains a tiny amount of THC as well as the other cannabinoids and terpenes that occur in the plant. Because the exact proportion of these chemicals vary in the source plant, it makes running the standard clinical test difficult, as that normally requires a single drug in controlled amounts. Advocates for the use of CBD, particularly in its full-spectrum form, argue that the beneficial effects of CBD are amplified by the other chemicals found in the cannabis plant. Teasing out how this works in practice is going to be a long and complex process. But in the meantime, CBD is gradually taking its place as a recognised treatment for epilepsy, and one with relatively few side effects in comparison to other drugs.

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FIBROMYALGIA

Relief from pain: no wonder many fibromyalgia sufferers have taken to using CBD

Fibromyalgia is one of those conditions that can blight a life, while still leaving the sufferer trying to convince medical professionals that there is something wrong with them. Essentially, it's pain: enduring, chronic pain through the whole body. What made the pain worse for sufferers for many years was the incredulity of the medical profession. Too often they would be dismissed as having nothing wrong with them or as being hysterical women for, it is true, most of the people who suffer from fibromyalgia are women. It was only accepted as a genuine disorder in 1990 and even today people can find it difficult to get a diagnosis. Symptoms of fibromyalgia include pain and a general increase in sensitivity to pain, stiff muscles, insomnia, headaches, irritable bowel syndrome, and mental problems – known as fibro fog – which include difficulties in remembering and concentrating.

One of the difficulties in getting fibromyalgia recognised as a genuine disorder is that we didn't, and still don't, understand what causes it. There's probably a genetic component but the actual onset of the condition is often brought about by some other factor, such as shock, stress or injury.

How fibromyalgia affects the body is still being investigated. There are many lines of investigation, ranging from changes in the function of the pain pathways, through to disruptions in the autonomic nervous system and the immune system leading to increased inflammation, to problems in the gut-brain system. With scientists being a long way from finding the cause of fibromyalgia, it unfortunately means a cure remains even further away. At the moment, treatment focuses on trying to manage and reduce the symptoms and includes exercise, painkillers, anti-depressants and cognitive behavioural therapy.

Given the debilitating nature of the condition and its frequent unresponsiveness to traditional treatments, it's no surprise that many sufferers have started investigating alternative treatments, including CBD and cannabis. Some researchers are investigating whether a deficiency in the endocannabinoid system could be the root cause, with promising, although still largely

anecdotal, reports of reductions in the symptoms.

A 2016 review postulated that an endocannabinoid deficiency might underlie fibromyalgia and other conditions of chronic pain, such as irritable bowel syndrome and migraine. Taking CBD would act to alleviate the endocannabinoid deficiency and thus reduce symptoms. Unfortunately, studies on the effectiveness of CBD as a treatment for fibromyalgia remain unsatisfactory, with the reports suffering from small numbers of participants, often with a high drop-out rate, lack of placebo controls and results that conflict: some studies report considerable reductions in pain levels while others state that they found no significant changes. For example, in reviews of the effectiveness of Nabilone, the synthetic cannabinoid approved for use as an anti-nausea drug for people undergoing chemotherapy, one in 2011 found it to be moderately effective in pain reduction, while another in 2016 found it no better than a placebo. The medical community is moving, quite slowly, to investigate these conflicting findings and establish the effectiveness or otherwise of CBD as a treatment for fibromyalgia. Many medical research papers end with the comment that further research is needed: this has seldom been truer than in the work on CBD and fibromyalgia.

However, while the research literature on the effectiveness of CBD for the alleviation of fibromyalgia remains frustratingly sparse and contradictory, within the community of sufferers, many have found CBD useful in reducing the symptoms of fibromyalgia. With a condition that is so poorly understood and so resistant to standard treatments, it's hardly surprising that sufferers have investigated other possibilities more eagerly than the medical establishment.

Among support groups, both online and in person, there are frequent anecdotal reports of CBD helping with fibromyalgia, ranging from the lessening of symptoms to almost complete cures. In these cases, sufferers usually begin with very small doses of CBD and then gradually increase the amount they take until they find a dose that reduces symptoms. While this is something of a DIY approach to fibromyalgia, it is still one that many patients have found beneficial. Even in those cases where CBD has not produced any benefit, it does not seem to do any harm, as opposed to the painkillers sometimes prescribed to reduce the symptoms of fibromyalgia.

> "MANY HAVE FOUND CBD USEFUL IN REDUCING THE SYMPTOMS OF FIBROMYALGIA"

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ANXIETY

How CBD might help reduce anxiety levels

We all feel anxious sometimes. It's wired into our brains and bodies, with evolutionary origins stretching back to Africa when our distant ancestors had to watch out for all manner of predators. Anxiety is our response to the prospect of danger; it's the body getting ready to run or to fight (or sometimes to freeze). As such, the body switches off the rest/digest systems and switches to flight/fight. Blood pumps to muscles, senses move to high alert, the brain goes into overdrive. That rustle in the grass over there, that might be a stalking lion.

But while these systems worked well when dangers were resolved quickly, today we respond in the same manner to much longer-lasting stresses. Our bodies and minds can then get stuck in a permanent state of high alert. In today's connected, 24-hour world, where work calls never stop, it's all too easy to become fixed into this state. As a result, anxiety disorders have mushroomed through the population. The mental health charity, Mind, estimated that in England in 2014, six percent of the population were sufficiently anxious to be diagnosed with generalised anxiety disorder (GAD). Since then, we have endured Covid lockdowns and a consequent explosion in mental health problems, so it's fair to assume that percentage has probably increased.

There are a variety of treatments for GAD. Non-pharmacological treatments include cognitive behaviour therapy and various forms of meditation, including mindfulness meditation, all of which can be effective. When it comes to pharmacological solutions, various anti-depressants can be helpful in suppressing symptoms.

However, in some cases people can become so anxious that even attempting the non-pharmacological therapies can induce a panic attack, while anti-depressants can be addictive as well as sometimes having unpleasant side effects. In these cases, some people have found using CBD an effective way of reducing their anxiety to a level where they can put in place one of the non-pharmacological interventions, which are designed to reduce the body's overall levels of stress.

> "SOME PEOPLE HAVE FOUND USING CBD AN EFFECTIVE WAY OF REDUCING THEIR ANXIETY"

While not yet approved as a medical treatment, it's easy to see why CBD might be helpful for treating anxiety. The body's endocannabinoid system plays a crucial, but still vaguely understood, role in regulating the levels of various neurotransmitters in the brain. Some neurotransmitters are produced in response to stress, others to facilitate rest and repair. CBD, which has a structure that mimics the body's

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own cannabinoids, helps to rebalance the system and reduce anxiety. While research is far from complete, a number of studies have found that using CBD has helped people experience significantly less anxiety. In terms of how it's taken, CBD in oil form or eaten as gummies takes longer to have an effect, while vaping CBD oil produces quicker results.

For people interested in using medicinal cannabis as an anti-anxiety drug, it's important to remember that while low doses of THC can have a calming effect, higher doses can provoke panic attacks. So when trying CBD for its anti-anxiety effects, it would be best to start with either CBD isolate or broad-spectrum CBD. In fact, the various studies on the effects of CBD on anxiety confirm that, as long as there is no THC, it works with few side effects. However, there have as yet been no broad-based clinical trials on the effectiveness of CBD as an anti-anxiety medicine, so it has not been approved as a recognised treatment.

CBD is not, in itself, a cure for anxiety but it does seem that it can help to reduce overall levels of anxiety – as well as the intensity and frequency of panic attacks – to manageable levels. This enables other methods of anxiety control to work, slowly returning the sufferer to more reasonable levels of stress.

DEPRESSION

Fighting back against the blues

According to the Office of National Statistics, one in six UK adults (17 percent) endured symptoms of depression during the summer of 2021. This was actually an improvement on earlier in the same year, when one in five adults (21 percent) were suffering from depression. These were markedly higher levels of depression than a few years before, when about ten percent of the adult population reported some form of depression. This increase was attributed to the lockdowns during the coronavirus epidemic but unfortunately, even though the epidemic has ended, the levels of depressive illness are showing little sign of returning to their pre-pandemic levels. According to the World Health Organisation, around four percent of the world's population suffer from depression – that's 280 million people. It's a huge

problem and one that the events of the last few years has only made worse.

Treatments for depression include antidepressant drugs, lifestyle changes and a range of psychological therapies, such as cognitive behaviour therapy and meditation, especially in its mindful form. However, even with this suite of treatments, people can still struggle to overcome depression and its debilitating effects.

One of the difficulties in getting out of the depressive rut is that the initial energy needed to begin and maintain some of the lifestyle changes and engage with psychotherapy simply isn't there. Depression leaches the energy from sufferers. Combine this with a history of failure and the two can feed back into a doom loop of hopelessness that prevents the sufferer from doing anything to improve their lot – even though they desperately want to get better.

As our understanding of the body's endocannabinoid system and its importance for mood regulation has developed, many people have started to use CBD as a potential treatment for depression. A 2022 study found that in a group of 90 patients who self-treated themselves with CBD for depression, 53 percent reported that it had definitely helped and 33 percent said that it had probably helped. There have also been a number of studies in animals that have found CBD helpful in treating depression. However, we are still waiting on proper clinical trials on human subjects. The experimental results so far are suggestive but not definitive.

As to how CBD might help with depression, we do know that the body's endocannabinoid system is crucial for the regulation of mood and emotions. The brains of people suffering from clinical depression produce less of a protein called brain-derived neurotrophic factor (BDNF). BDNF facilitates the production of new nerves and new neural connections in the brain. When BDNF levels fall, the brain finds it harder to rewire itself. People suffering from depression often report themselves as being stuck in a rut, with their minds running in deep grooves from which they cannot extricate themselves. Lower levels of BDNF may explain why it is so difficult for people with depression to break out of the mental and behavioural pathways in which they have become stuck – their brains are simply unable to make the new connections to break the old patterns.

Recent research suggests that healthy levels of BDNF are associated with a healthy endocannabinoid system. So when the endocannabinoid system is depleted, levels of BDNF can fall, making it easier to fall into depression and harder to escape from it. CBD is a plant mimic to the body's own cannabinoids, suggesting a mechanism by which it can help the body's endocannabinoid system regain balance. This could then enable a higher production of BDNF.

Research findings on this area are still very much in their early stages. Nevertheless, people suffering from depression are trying out CBD on their own, with many finding it useful. In the 2022 study on people self-medicating with CBD, 51 percent did not tell their psychiatrist what they were doing. This is never a good idea, particularly if someone is being prescribed antidepressant drugs. While CBD on its own seems relatively safe, there is as yet little knowledge of how it might interact with other drugs.

Although not a 'cure' for depression – no single treatment could be for a disorder with so many causative pathways – CBD may nevertheless prove to be a helpful additional treatment, particularly for people struggling to implement any of the non-pharmacological treatments for depression.

> "MANY PEOPLE HAVE STARTED USING CBD AS A POTENTIAL TREATMENT FOR DEPRESSION"

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CHRONIC PAIN

Wouldn't it be good to be able to get through a day without pain? For many people, that would be a dream

Lots of people are in pain. A 2016 study estimated that 28 million people in the UK suffer from chronic pain, which is pain that has lasted longer than three months. Pain is the body's way of signalling that there's something wrong and, as a consequence, chronic pain can be the result of a very wide range of causes, from back pain and arthritis to headaches and hypersensitivity. While chronic pain can affect anyone, it is strongly associated with ageing and it can have a devastating effect on quality of life in elderly people.

There are four common types of chronic pain:

- **SOMATIC (BODY) PAIN** in muscles, skeleton or joints and surrounding tissue. Examples include arthritis and back pain.
- **NEUROPATHIC (NERVE) PAIN** where the pain comes as a result of a damaged nerve or nerves.
- **PSYCHOGENIC PAIN** where mental stress exacerbates the physical symptoms, for example tension headaches.
- **CENTRAL SENSITIVITY PAIN** where the body's pain system has become overly sensitive so that even ordinary sensations can be felt as excruciatingly painful.

Medical treatments of chronic pain have mostly focused on the prescription of painkillers. However, the overuse of drugs such as fentanyl, a strong opioid, has produced something of an epidemic of opioid addiction. People suffering chronic pain have often been prescribed these painkillers without adequate warning of the potential side effects.

While drugs may be helpful for the short-term control of pain, studies have definitively shown that exercise is extremely beneficial. Our bodies were made to move and the immobility that so often results from chronic pain only serves to exacerbate the pain. Unfortunately, inactivity resulting from chronic pain often leads to weight gain, which makes it harder to exercise, which makes it harder to take the physical actions necessary to control many types of chronic pain. Opioid painkillers make matters worse in these situations, as they often leave the patient feeling disconnected and lacking energy.

Caught in such feedback loops, people have been trying CBD as a form of self-medication, with many reporting good results. In one survey, 60 percent of the people using CBD in the United States were doing so for pain relief. However, as in so much else to do with CBD, medical research is lagging behind and there are no government-approved CBD treatments for the relief of chronic pain. Where studies have been carried out, though, the results have been positive. A 2018 review of studies conducted between 1975 and 2018 found that CBD was effective in pain relief with negligible side effects. Sativex, the 1:1 mix of CBD and THC approved for prescription for multiple sclerosis in the UK, was found to be effective in helping people with severe chronic pain in a 2019 study.

The body's endocannabinoid system plays a major part in regulating the body's pain systems and its receptors are found throughout the body, in the brain and spinal cord, in organs and nerve cells, and body tissue and immune cells. As CBD mimics the body's natural cannabinoids, it can help the endocannabinoid system return to balance, in particular improving the stress feedback loop that occurs with the prolonged experience of severe pain. That's when the anticipation and knowledge of pain causes an increased emotional and stress response to pain. It's essentially our whole system tensing to cope with the pain. Unfortunately, that tensing only makes the pain worse. Learning to relax into the pain actually lessens the experience of pain.

Although further study is certainly needed, there's sufficient anecdotal evidence to say that many people have found CBD helpful when dealing with chronic pain. However, one note of caution should be sounded. While CBD itself generally causes few and minor side effects, we still know very little about how it interacts with other drugs. As people suffering from chronic pain are often prescribed many medicines, it is important to consult a doctor before starting to take CBD, as doing so may alter the effect of an existing medicine.

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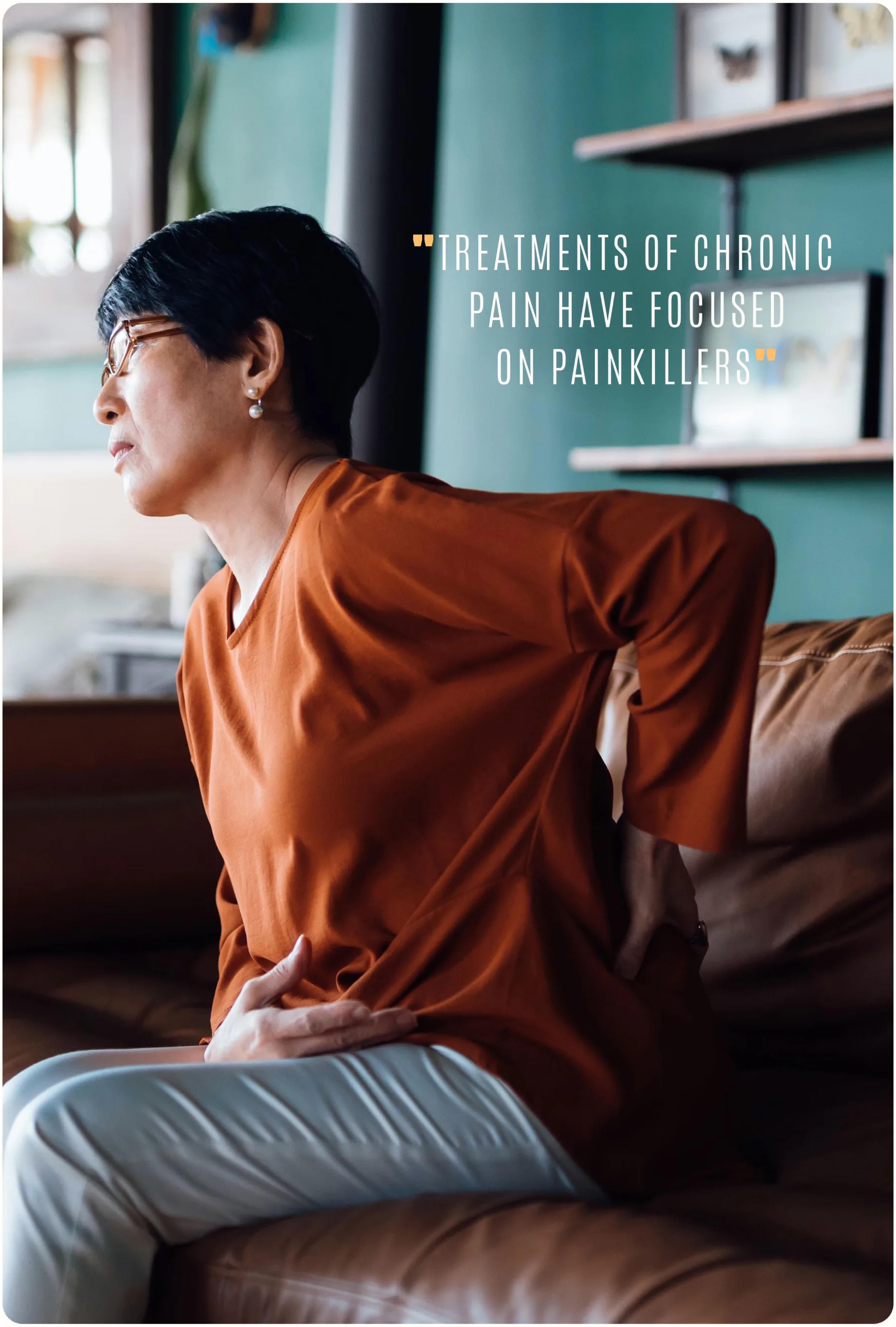


"TREATMENTS OF CHRONIC PAIN HAVE FOCUSED ON PAINKILLERS"

ARTHRITIS

It's only when it hurts to move that you realise how much you take it for granted

Arthritis, whether osteoarthritis, rheumatoid arthritis or one of the rarer forms, is a disease of the joints. It's one of the most common causes of debilitating pain, particularly among older people. In osteoarthritis the cartilage that lines bone joints roughens and wears thin, producing swelling and bony spurs. In severe cases, bone can end up rubbing on bone. Osteoarthritis usually starts in the mid-40s, is more common among women and in those with a genetic predisposition to the disease. This is the most common form of arthritis in the UK.

Rheumatoid arthritis results from the immune system attacking the joints, producing inflammation and swelling. As with osteoarthritis, it is more common among women. The normal age of onset is between 30 and 50. As the joint covering and lining swells, the joint may be forced out of shape, causing bone and cartilage wear.

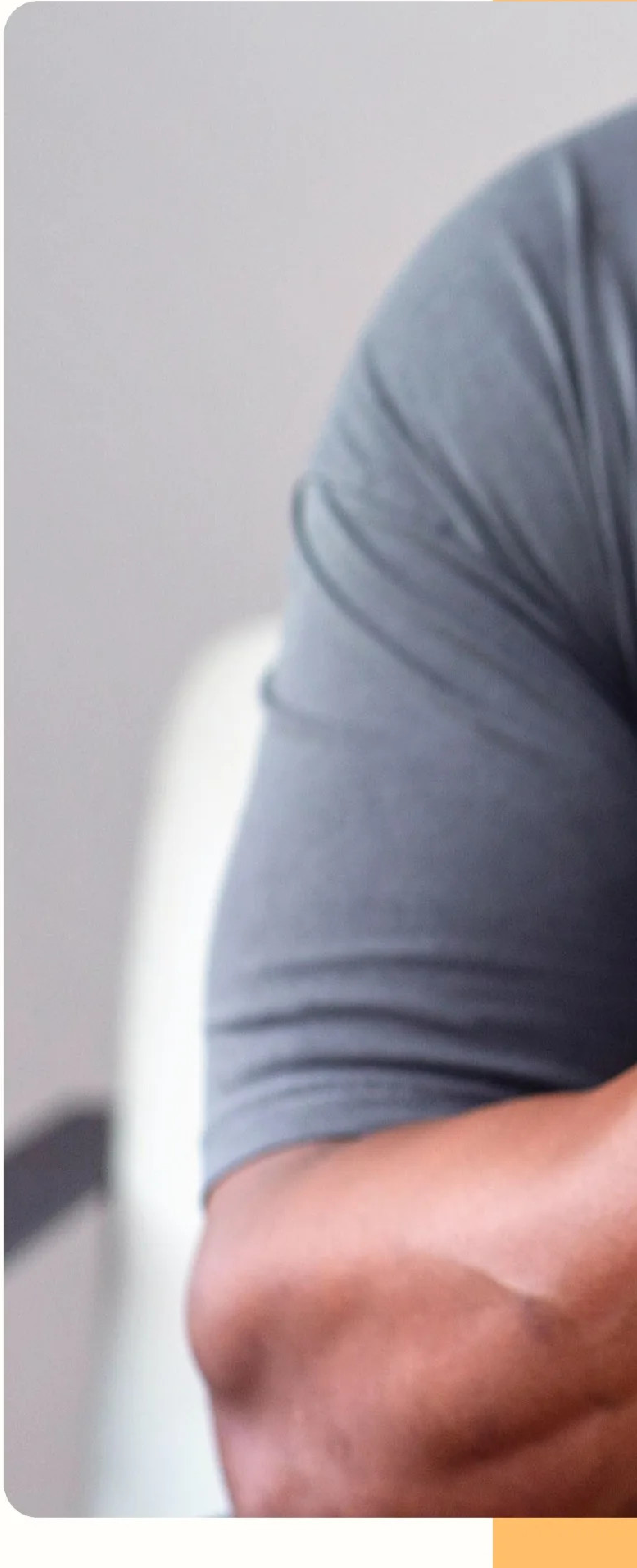
While these are the most common forms of arthritis, there are many other forms it can take, including gout, ankylosing spondylitis, cervical spondylosis and lupus. Given the many causes of arthritis, the different ways they affect the joints, coupled with the fact there is no cure, it's not surprising that there is a wide variety of treatments. Being a chronic condition that, at its worse, can be completely incapacitating, sufferers have naturally looked for other options beyond the standard range of medical treatments.

For osteoarthritis, standard treatments include surgery, various drugs, and lifestyle changes. For rheumatoid arthritis, the treatments run from surgery through anti-inflammatory medicines to physiotherapy. However, despite the wide range of treatments, many arthritis sufferers continue to endure considerable pain. In such circumstances, some sufferers have started to investigate alternative treatments, including CBD.

A number of animal studies have indicated that CBD can relieve pain and reduce inflammation. Further work suggests it might be helpful but, as yet, there has been a distinct lack of good clinical trials. Anecdotal evidence for its efficacy can be found in arthritis forums and self-help groups but, given the wide range of causes for arthritis and how the disease develops, it is likely that even in the best-case scenario, it won't work for everyone.

An important caveat for people self-medicating with CBD is that

> "DESPITE THE WIDE RANGE OF TREATMENTS, MANY ARTHRITIS SUFFERERS ENDURE PAIN"



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we have very little idea of how it will interact with prescribed anti-arthritis drugs. As such, anyone considering trying CBD to help control their arthritis should really speak to their doctor first to check if it might affect any medicines they are already taking.

With that warning in place, some arthritis sufferers have reported that topical CBD ointments have been helpful in reducing pain. A topical ointment is one that is rubbed into the skin rather than being ingested. As they are applied externally rather than being ingested, they are very low risk. Patients report that topical CBD ointments often work better after a hot shower, when the skin pores have opened and the ointment can penetrate more deeply. As a treatment, topical ointments work best on joints that are near the skin surface, such as fingers and toes, ankles and knees, wrists and elbows. Because rheumatoid arthritis is an anti-inflammatory disease, it might respond better to CBD than osteoarthritis. Indeed, a large sub-section of people with rheumatoid arthritis self-medicate with CBD, many reporting significant improvement in symptoms. In such cases, topical ointments are often supplemented with CBD taken orally. When experimenting on dosage, the adage is always to start low: that is, to take small amounts of CBD and only gradually increase the dosage, stopping when some effect is noticed. If no effect is produced within a couple of weeks, then it is best to discontinue its use.

INSOMNIA

What would you do for a good night's sleep?

Lying awake, staring at the ceiling at three in the morning is an incredibly lonely and frustrating experience. The problem is that more and more of us endure this on a regular basis. According to the NHS, insomnia affects a third of the population, with its incidence increasing as people get older.

Not only does insomnia leave us tired the next day, an increasing number of studies are showing that, over the long term, insomnia can lead to or exacerbate a wide range of conditions, including anxiety and depression, diabetes, heart disease, obesity and strokes. While some people might boast about being able to get by on four or five hours sleep a night, it is becoming increasingly clear from sleep research that the body uses the time when we are asleep to carry out a whole range of functions vital to our long-term health, from carrying out repairs to putting memories into storage.

Sleep is a natural part of the circadian rhythm but modern society can easily knock this rhythm out of kilter. Artificial lights after sunset, stimulants in evening drinks, and the constant hum thrum of social media winking at us from screens – it's a wonder that we manage to get to sleep at all.

> "CBD HELPS SOME PEOPLE OVERCOME INSOMNIA, WHEREAS FOR OTHERS IT DOES NOTHING"

For the third of the population who struggle to get to sleep, the most common medical advice is to make some lifestyle changes – switch off the phone, don't drink coffee before bed, establish a fixed bedtime routine. This can also be complemented with psychotherapy and behavioural cognitive therapy. These can be very effective in many cases – we should never underestimate how helpful going to bed at the same time each night can be. However, there remains a significant amount of people for whom none of these non-pharmacological treatments work.

Having realised the side effects that arise from long-term use, doctors have become much more reluctant to prescribe anything other than a short course of sleeping pills. So people suffering from extended periods of insomnia have started investigating the effectiveness of CBD. Unfortunately, the published research on this is all over the place. Some studies on animals have found that CBD increased wakefulness and stopped sleep, others have found the exact opposite.

Studies on humans, although conducted on fewer subjects, have been somewhat more positive. One study found that CBD helped people with chronic anxiety, seeming to both aid sleep and reduce anxiety (the two being intimately linked). Another study on patients with Parkinson's disease found that CBD improved their sleep by helping them have better REM sleep, which is often disrupted by the disease.

Studies and anecdotal reports suggest that CBD can act, on different people, both to aid sleep and to suppress it. That the endocannabinoid system is a key player in regulating the body's sleep patterns is becoming clearer, but how it does so remains largely unknown. The different reported effects may have something to do with people suffering from different forms of insomnia, relating to REM (dreaming) sleep and non-dreaming sleep.

At this stage, both the published literature and anecdotal reports are confused and confusing. CBD seems to help some people overcome insomnia whereas for others it does nothing, or can even make things worse. As such, it seems to be more likely to be effective when a patient's insomnia results from chronic pain or anxiety, where the efficacy of CBD has been better established.

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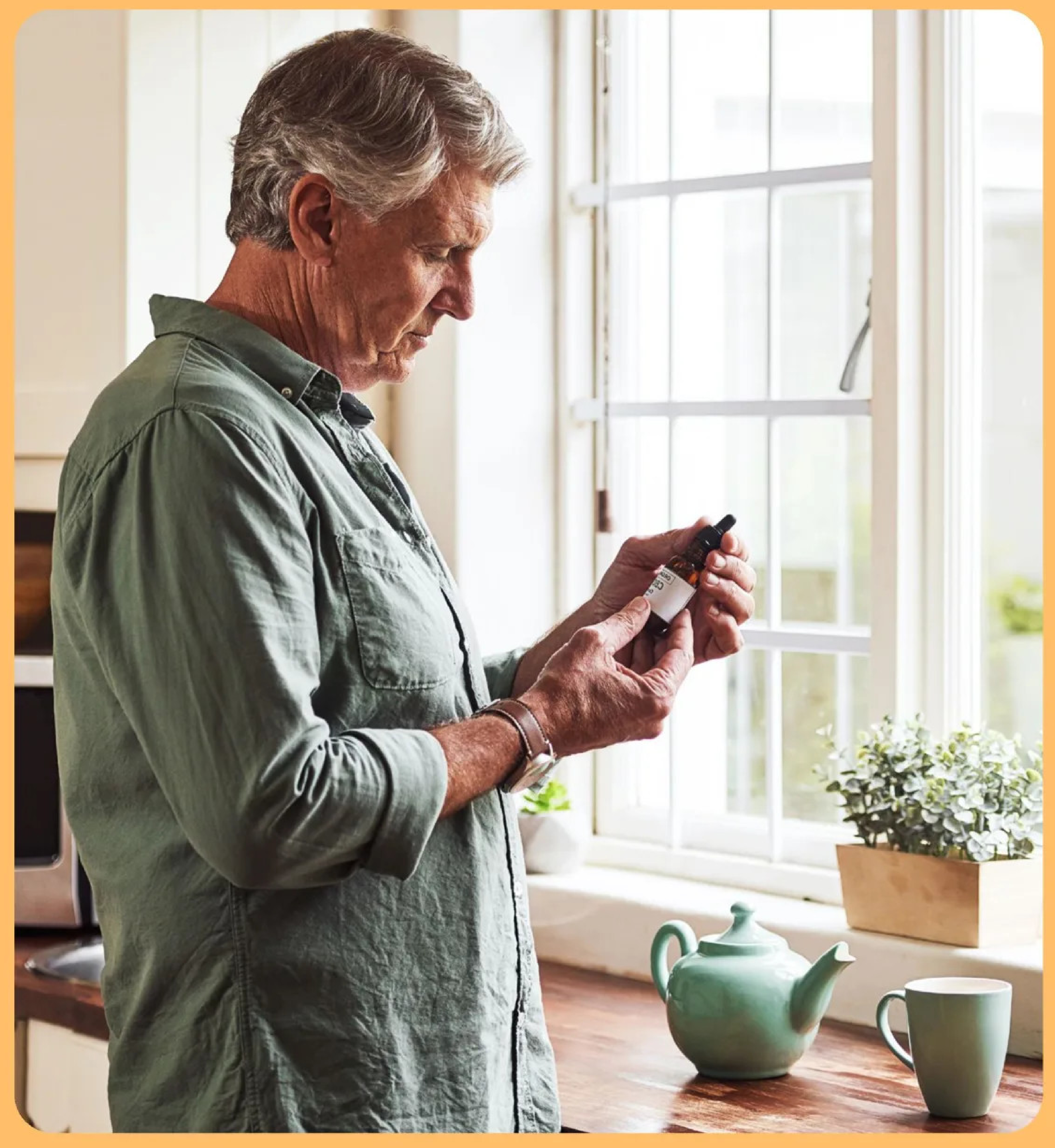
WHAT ELSE CAN CBD BE GOOD FOR?

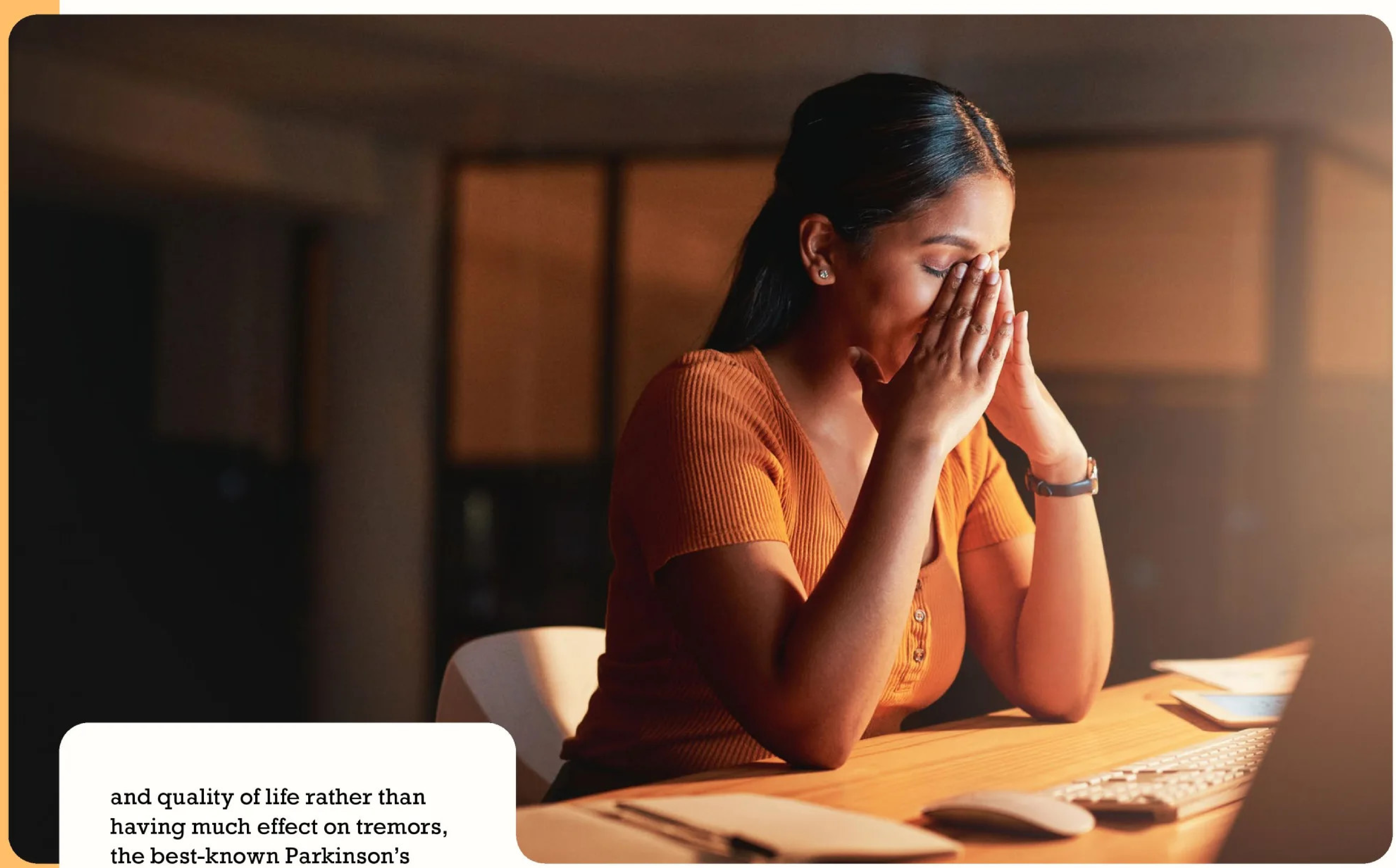
A look at some of the other conditions that CBD could help treat



We are in the investigative stages of CBD, with people trying it for just about everything under the sun. There are all sorts of reports of miraculous results, many of which will prove to be a result of the placebo effect (which should not be knocked: belief that a medicine will work produces a marked improvement in efficacy over the same substance taken without that belief). But among the most promising areas to investigate are those allied to diseases where we already know CBD can help – multiple sclerosis and epilepsy. MS is a neurodegenerative disease and other neurodegenerative diseases include Alzheimer's and Parkinson's disease.

Although still in the early stages, some laboratory studies have shown that cannabinoids can remove the beta-amyloid plaques that accumulate in the brain of an Alzheimer's patient. If this proves true, it could be a key advance in the treatment of Alzheimer's. Even if it should prove to be another dead end – there have been a lot of these in Alzheimer's research – other research indicates that combinations of cannabinoids including CBD and THC can help with some of the behavioural symptoms of Alzheimer's.

With respect to Parkinson's, a disease that conventional treatments do little for, many patients have begun self-medicating both with CBD and combinations of CBD and THC. So far, reports suggest that they work best on sleep disturbance



and quality of life rather than having much effect on tremors, the best-known Parkinson's symptom. As Parkinson's affects the nervous system, self-treatment with CBD has to be very cautious, beginning with very low doses.

Given the endocannabinoid system's connection to so many areas of homeostatic regulation, another area attracting considerable attention is how CBD can be used to help people suffering from chronic stress. We live in a stressful world. Stress levels, that might have been already high, have been exacerbated both by technological changes – the always-on interconnected world of social media and work emails – and the huge stresses caused by the coronavirus epidemic. With CBD being particularly effective in returning the endocannabinoid system into balance, many people have found taking CBD helpful in reducing their stress levels.

Stress, when taken to an extreme level, produces post-traumatic stress disorder. There's good evidence that CBD can help in reducing anxiety and now some patients with PTSD have started trying CBD and CBD/THC mixes, with cautiously encouraging results. But, as with so many other disorders, this requires further research.

> "COMBINATIONS OF CANNABINOIDS CAN HELP WITH SYMPTOMS OF ALZHEIMER'S"

In terms of pain management, some women have started experimenting with applying topical CBD oils to their abdomens to help with period pains, with reportedly good results. Some women have even gone so far as to use CBD-infused vaginal suppositories. It is important to point out that there are no clinical studies on the effectiveness of these, and thus no reports of possible side effects. Proceed with caution!

Following on from period pains, older women have reported that CBD has been useful in helping with some of the symptoms of the menopause. There's an almost complete dearth of published research on this topic but for many women, it has proved a useful alternative to hormone replacement therapy.

As you can see, we are in the phase of investigation where CBD, the hot new thing, is being tried for almost everything. But because it mimics the structure of the body's own cannabinoids, and because we are learning more and more about the importance of the endocannabinoid system, it's quite possible that it really will prove to have a wide range of benefits. Perhaps the future will prove to be shaped like a cannabis leaf.

Images Getty

CBD PRODUCTS TO TRY

There's a huge number of CBD products on the marketplace today… here are some of the best

WORDS BY **EDOARDO ALBERT**

OILS

1

Cannaray Bright Days CBD Oil Drops

Cannaray is making waves through excellent products, clear packaging and customer transparency as to what is actually in the drops. The oil is tested three times and is free from THC but infused with lime to take away the CBD oil taste, which is very much a Marmite flavour – some love it, some hate it. Cannaray is available through many retail outlets, including Holland & Barrett and Superdrug, as well as from the Cannaray website, making it one of the easiest brands to buy.
cannaraycbd.com

2

Blessed 500mg CBD Oil Drops

Blessed products are regularly voted the best CBD oil and it's not hard to understand why. This 500mg bottle is available in both full-spectrum and broad-spectrum forms, making it easy to decide whether you want to include a small amount of THC in your dose of CBD along with the terpenes and cannabinoids found in the broad-spectrum oil. The dropper included in the bottle makes it straightforward to calculate how much CBD you are taking each day, and the oil is rigorously tested by an outside laboratory.
blessedcbd.co.uk

3

Hempura Original CBD Oil

CBD oil can seem a product for the wealthy so it's good to see a more affordable option. The oil is manufactured in Britain from organic hemp plants grown in Eastern Europe, which are then tested by an outside laboratory. This is a full-spectrum CBD oil but the levels of THC it contains are very low, below 0.01%, which makes it a good option for trying full-spectrum CBD oils for the first time.
hempura.shop

4

Holistic Hemp Scotland 20% Raw CBD+CBDA Tincture Oil

This small Scottish company grows its hemp on European farms, free from pesticides, and then hand-picks them, ensuring high quality from the plant products. This is a full-spectrum CBD oil, so it contains a small amount of THC, as well as the full range of terpenes and cannabinoids that were present in the parent plant. It's a distinctive tasting oil, with a somewhat spicy flavour, that's right up the taste street of some people.
holistichempscotland.com

5

Love Hemp CBD Oil Drops

Love Hemp provides a full range of CBD products of various strengths, ranging from this mild version to extra strong varieties, but they are all certified by independent laboratories as free from THC, making them ideal for people who want to ensure that their CBD does not contain any THC. If you don't like the taste of CBD oil, it's also available in peppermint, orange and cherry flavours. Love Hemp products are stocked by Boots and Holland & Barrett too, making them nice and easy to find.
lovehemp.com

1
from £18.00
2
£39.95
3
from £21.99
4
£66.00
5
from £14.99

Prices and availability correct at the time of publication.
Lead Image Getty

CAPSULES

1 Vibes 1200mg CBD Capsules

These Vibes capsules, which remove the need to actually taste the CBD you're taking – a blessing for some – are broad-spectrum, so safe from THC. However, thanks to the range of terpenes present in the organically-grown hemp from which Vibes sources its CBD, the capsules benefit from the natural synergy between the different compounds that were present in the original plant.

vibescbd.co.uk

2 Blessed 900mg CBD Capsules

Blessed produces CBD isolate products, so what you get in one of its best-selling capsules is CBD and nothing else: no other cannabinoids and particularly no THC, no terpenes and no flavonoids. So this is an excellent way of testing how well pure CBD works for you. As a capsule, there's no choice in the amount of CBD you take, it's a capsule a day, each containing 30mg of CBD, but it makes for a no-nonsense approach that many people favour.

blessedcbd.co.uk

3 CBDLife Raw Hemp Extract Capsules

CBDLife is a major player in the effort to get products derived from cannabis recognised and available in Britain, helping to found and now acting on the board of the Cannabis Trade Association. CBDLife manufactures full-spectrum CBD capsules, with a THC content independently certified to be below 0.2%, that also contain a full range of terpenes and flavonoids. The capsules are an excellent way of gaining the full benefit from this range of compounds without having to endure the taste, which would be necessary with a CBD oil.

cbdlifeuk.com

4 Love CBD Dutch CBD Capsules

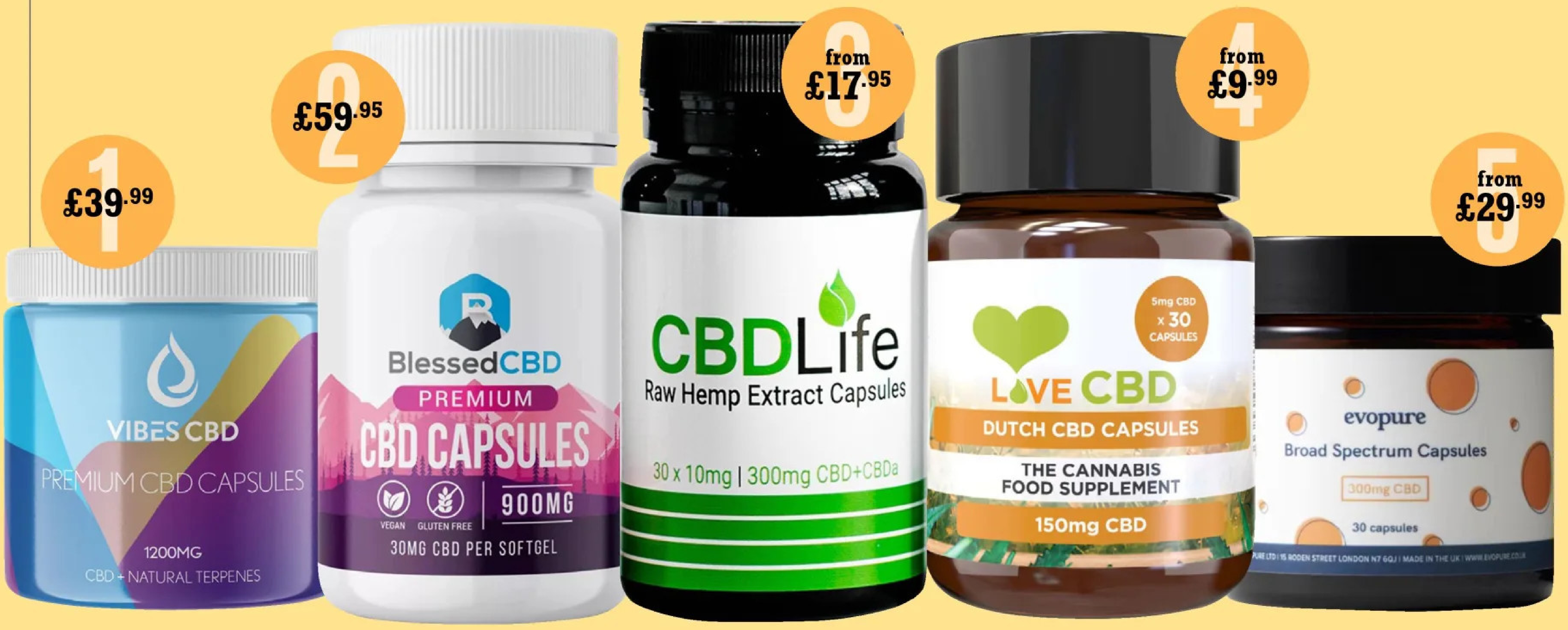
These Love CBD broad-spectrum CBD capsules provide excellent value for money, particularly for those who are trying CBD for the first time. While the amount of CBD in each capsule is relatively small at 5mg, being broad-spectrum products they contain many of the terpenes found in the original plant. Love CBD uses organic coconut oil as the carrier for the CBD in its capsules, and also manufactures its products in Britain, near Cambridge.

lovecbd.org

5 Evopure Organic CBD Capsules

Evopure makes broad-spectrum CBD products using the CO_2-extraction process, which is widely regarded as being the best way to extract CBD from the original plant, because it does not require the use of any solvents in removing the CBD from the hemp. Evopure uses organically grown hemp and eschews genetically modified plants while working hard to ensure the sustainability of its products. The products are suitable for vegans, too.

evopure.co.uk


1 £39.99
2 £59.95
3 from £17.95
4 from £9.99
5 from £29.99
VIBES CBD
PREMIUM CBD CAPSULES
1200MG
CBD + NATURAL TERPENES
BlessedCBD
PREMIUM
CBD CAPSULES
VEGAN GLUTEN FREE
900MG
30MG CBD PER SOFTGEL
CBDLife
Raw Hemp Extract Capsules
30 x 10mg | 300mg CBD+CBDa
5mg CBD x 30 CAPSULES
LOVE CBD
DUTCH CBD CAPSULES
THE CANNABIS FOOD SUPPLEMENT
150mg CBD
evopure
Broad Spectrum Capsules
300mg CBD
30 capsules

VAPE LIQUIDS

1 CBD Ultra E-liquid

Vaping gets CBD into the blood stream quicker than taking CBD oil or a capsule, although the effects do not last as long as the other two methods. Vaping does, however, get a larger proportion of the CBD in the product into the body than oil or capsules. The CBD Ultra range of vape oils are full-spectrum, so they contain THC as well as a range of cannabinoids and terpenes along with CBD, but what sets this product apart on the vaping market is that it does not use vegetable glycerine or propylene glycol as its suspension medium. Instead, it is a CBD oil to be used with ceramic coil vaping pens, so you will need the right equipment in order to take it. The flavour is based on popular varieties of cannabis.

cbdultra.co.uk

2 Hempura Refined CBD Vape Juice with Terpenes

This is an excellent broad-spectrum vape juice, so it contains CBD alongside the terpenes that occur naturally in the cannabis plant but has no THC. The CBD is contained in a mixture of propylene glycol and vegetable glycerine. The source hemp comes from organic European farms and the outside laboratory results are available on the Hempura website database, allowing customers to track the exact batch number of the product they are using and check its contents. The terpenes give the juice a citrus flavour.

hempura.shop

3 Provacan CBD E-liquid

Provacan CBD vape juice is unflavoured and full-spectrum, making it a good choice for people who like the natural taste of hemp. Being a full-spectrum juice, it has a tiny amount of THC, less than 0.05%, as well as other cannabinoids and terpenes. Being unflavoured, it works well when combined with other, flavoured, vape juices. The source hemp comes from organic European farms and the carrier juice is a 70:30 mix of vegetable glycerine and propylene glycol.

provacan.co.uk

4 Harmony E-liquids

Harmony E-liquids are the ideal brand for people who like vaping different flavours. This range of CBD isolate vape juices has an impressive collection of 12 different flavours, including pink lemonade, strawberry, pineapple, mango and baked custard, as well as some that reproduce the flavours of different cannabis strains, such as New York Diesel and Skunk. The carrier liquids are the usual mix of vegetable glycerine and propylene glycol.

meetharmony.com

5 CBDfx Vape Oil

CBDfx has been a major player in the US for nearly a decade but has now expanded to the UK and Europe, with a website selling on this side of the Atlantic. Its vape juices are CBD isolate and come in five flavours including the less common watermelon and strawberry milk as well as the more usual strawberry and peppermint. Their website also sells the kit necessary to vape.

cbdfx.co.uk

1 £45.00
CBD Ultra
Vape Oil
LEMON HAZE
10% CBD
100MG / 10ML
ZERO THC
2 from £21.99
500MG CBD VAPE
CITRUS TERPENE PROFILE
HEMPURA
PREMIUM WHOLE PLANT CANNABIS SATIVA HEMP EXTRACT
10ML
3 from £24.99
PROVACAN
CBD
E-Liquid
600 mg CBD
10 ml 0.3 fl oz
4 £6.99
O.G. KUSH
E-liquid
Harmony
5 from £29.99
VAPE LIQUID
CBD Fx
WILD WATERMELON
2000MG CBD | 60ML

Prices and availability correct at the time of publication.

GUMMIES

1 Excite CBD Gummies Neon Rings 750mg

An easy way to take CBD is by popping a gummy into your mouth and chewing, and more and more manufacturers are making this option available. Excite CBD Gummies are broad-spectrum and available in different flavours including mixed tropical and cola flavour. These neon rings contain 25mg of CBD in each gummy, but if the price puts you off, there are more affordable tubs containing 10mg of CBD in each gummy. These lower dose gummies are a great stepping stone for those wanting to try CBD gummies.
excitecbd.co.uk

2 Supreme CBD Gummies

Supreme provides a wide price range of gummies, starting with £9.99 bags of mild strength gummies containing eight to 12 sweets, each with 16mg of CBD (or 25mg if you pick the worms). The gummies are broad spectrum and come in various fruity flavours. Supreme products are independently tested in outside laboratories, with the lab results available on the website. They make a good value entry-level product for people trying CBD gummies for the first time.
supremecbd.uk

3 ZenBears CBD Gummies

Unlike other companies, ZenBears concentrates solely on making CBD gummies. Its gummies are broad-spectrum and THC free, containing 20mg of CBD in each gummy. Those trying CBD for the first time would be best eating half a gummy to start with and testing for results rather than chewing the whole thing. The source hemp is imported from organic farms in Oregon, USA, and then manufactured in Britain, where the gummies are coated with a CBD distillate.
zenbears.co.uk

4 Orange County CBD Gummies

Orange County is the go-to brand for people who happen to have a CBD gummy sweet tooth: it makes a wide range of flavours – cherry, strawberry, peach and mixed fruit – as well as many shapes including worms, cubes, bottles and rings, making for bright and colourful tubs that would not look out of place in a Victorian sweet shop. The gummies are broad-spectrum and come in a variety of strengths, so you should be able to find one that suits.
orangecounty-cbd.com

5 The Good Level CBD Gummies

The Good Level CBD gummies are full-spectrum, so they contain a tiny amount of THC as well as CBD and the full range of cannabinoids and terpenes found in the original plant. The source hemp is cold pressed to remove the compounds used in the gummies and each gummy contains 10mg of CBD. Rather than having different flavour pots, each pot contains a mix of lemon, apple, pineapple, blackberry, orange and strawberry flavours.
thegoodlevel.com

1 £54.95
excite [CBD]
NEON RINGS CBD GUMMY
750MG PER PACK | 25MG PER GUMMY
2 from £9.99
SupremeCBD
CBD GUMMY STRAWBERRIES
1600mg Per Tub
3 £34.95
ZEN BEARS
CBDGUMMIES
600MG CBD
4 from £10.00
ORANGE COUNTY CBD
Food Supplement
CBD EDIBLES
1600mg
500g
THC FREE
5 £29.99
THE GOOD LEVEL
SUGAR FREE
CBD RICH GUMMIES
300MG | 10MG PER GUMMY

BALMS & TOPICAL CREAMS

① FourFive CBD Muscle Rub

FourFive was developed by former rugby players Dominic Day and George Kruis to help with sports injuries. As sportspeople, they were obviously concerned to ensure that there could be no question that sportspeople using their product might fail drugs tests, so their muscle rub is made from CBD isolate and tested to Banned Substances Control Group (BSCG) standards, the standard used by Olympic athletes to ensure that the products they use will not fall foul of any drug-testing regimes.
fourfive.com

② Puresport 1000mg CBD Muscle & Joint Balm

The Puresport jar of CBD balm has proved very popular among sportspeople, both for its high strength and for the reassurance that comes from it being tested to the Banned Substances Control Group standards, ensuring that anyone using it will not run into problems with any sports drug-testing regimes. While certified free of THC, the balm also contains lavender, lemongrass and witch hazel to help healing.
puresport.co

③ Edensgate CBD Balm for Muscle & Joint Relief

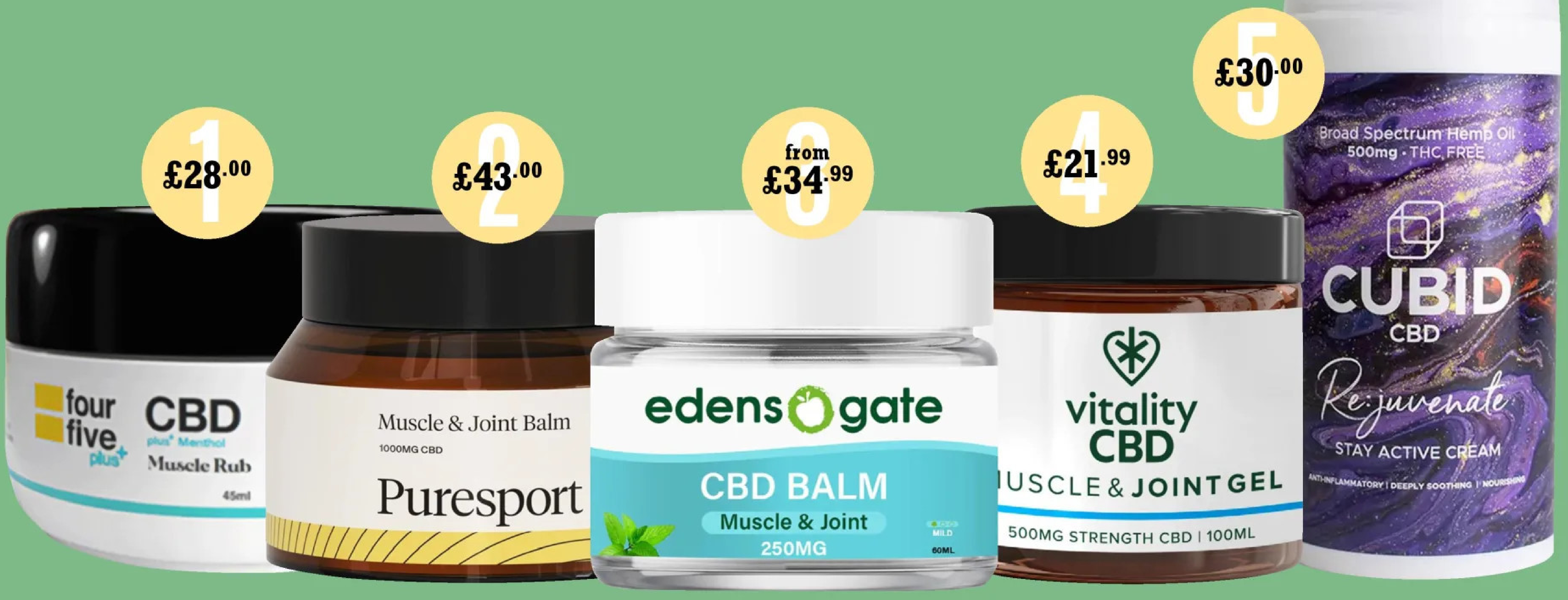
This is a high-strength, full-spectrum CBD cream designed to bring relief to muscle and joint pain. Along with full-spectrum CBD, the balm contains arnica, menthol and ginger to increase its anti-inflammatory and soothing properties. Its ingredients are all organic and it is best applied by rubbing into the affected area until the cream has been completely absorbed.
edensgate.co.uk

④ Vitality CBD Muscle & Joint Gel

Vitality has formulated this gel specifically to target joint pain rather than the more general relief of muscle pain. As such, it contains more CBD than its muscle balm, with the gel formulation helping absorption into the tissues around a joint. Vitality's products are available in many high-street shops as well as online and it's well priced in comparison to many other products, making it a more affordable method of pain relief.
vitalitycbd.co.uk

⑤ CUBID CBD Re:Juvenate Stay Active Cream

As well as eating and breathing CBD, some people find it helpful to apply CBD creams and balms directly to the skin to help with pain. Being an anti-inflammatory, there are many anecdotal reports of topical CBD creams helping to relieve arthritic and muscle pain, whether that be from injury or other causes. CUBID manufactures a broad-spectrum CBD cream that also contains arnica, menthol and other relieving plant extracts to help reduce inflammation and pain.
cubidcbd.com


1 £28.00
2 £43.00
3 from £34.99
4 £21.99
5 £30.00
four five plus+ CBD plus+ Menthol Muscle Rub 45ml
Muscle & Joint Balm 1000MG CBD Puresport
edensgate CBD BALM Muscle & Joint 250MG 60ML
vitality CBD MUSCLE & JOINT GEL 500MG STRENGTH CBD | 100ML
Broad Spectrum Hemp Oil 500mg · THC FREE CUBID CBD Re:juvenate STAY ACTIVE CREAM ANTI-INFLAMMATORY | DEEPLY SOOTHING | NOURISHING

Prices and availability correct at the time of publication.

Image Getty

4

LIFESTYLE

It's not just our health that can benefit from cannabidiol – embracing CBD in our beauty and wellness routines can make us look and feel better too!

COOKING WITH CBD

Explore the art of preparing the most nutritious CBD culinary creations

WORDS BY **AILSA HARVEY**

For those who have chosen to ingest CBD for its health benefits, the next stage to consider is how to incorporate it into the diet. Although many people choose to swallow CBD oil by itself, holding it underneath the tongue to be absorbed, this method can leave a strong taste in the mouth and prohibit the tongue from tasting other foods properly for a short period afterwards. For these reasons, cooking with CBD to blend it subtly into any favourite meals and drinks is growing in popularity. Before doing so, you should learn how to cook with CBD effectively to maximise the medicinal properties of its molecules – cannabinoids and terpenes – in the body.

Cannabinoids and terpenes begin to break down when exposed to temperatures of 160 to 180 degrees Celsius (320 to 356 degrees Fahrenheit). This means that anything you wish to cook CBD into needs to be done with caution and on a low heat if you wish to retain its value. As long as you are aware of this vital element, using CBD in your home-cooked treats can be a simple task. Some creations can be made in cold blends, such as smoothies, while stovetop-cooked food should be removed from the heat for a while before the CBD is added.

Almost anything you would usually cook can be infused with CBD. This includes sauces, baked goods and soups. But, how can you make sure you are getting the optimal health results from your cooking? Here is your guide to cooking successfully with CBD, including which methods to avoid and which foods will help you achieve your goal.

Image Getty

When is CBD best absorbed?

You might think that the only element of adding CBD to your body that you are in control of is ingesting it in the first place. However, you have much more control than this. When you eat CBD, the ingredients you combine it with greatly influence how much is absorbed into the bloodstream. Without considering these crucial factors, the pain, anxiety and other symptom-reducing qualities of CBD pass through your body without delivering any of the benefits. The rate at which the precious active compounds of CBD are absorbed is called bioavailability.

Cooking with CBD, instead of swallowing CBD oil by itself, is the first step you can take to increase the compounds' bioavailability. Studies have shown that ingesting CBD with other foods maximises how much of it is absorbed. As the stomach and intestines work to absorb other foods in the digestion process, more CBD compounds follow the path of other nutrients. Another reason that you shouldn't take CBD on an empty stomach is that when consuming it with food, CBD remains in the digestive tract for longer. The longer it takes to travel through the body, the more of it is absorbed and the greater the role it can play in your biological processes. Regardless of how you choose to ingest CBD, though, the results are unlikely to take form immediately. You should take care to be consistent with your chosen method and the effectiveness will be revealed after multiple meals.

The absorbing abilities of food

Fatty foods are regularly given a bad rap when it comes to human health. However, when combatting chronic pain, inflammation, mental disorders and other conditions, CBD is most effectively absorbed with high-fat foods. Some examples of these include avocados, fatty fish, nuts, eggs and cheese.

Fish, such as salmon, mackerel, sardines, trout and herring, have a high omega-3 fat content. Ingesting CBD after eating any of these fish increases its absorption. But, did you know that you can

"ONE OF THE EASIEST WAYS TO BEGIN TO INCLUDE CBD INTO YOUR DIET IS TO MAKE YOUR OWN DRINKS"

combine the fish and CBD to maximise the health potential of each mouthful and elevate the flavours of the dish? One way in which you can do this is to cook any of these fatty fish in CBD oil. To remove any likelihood of CBD compounds diminishing in the heat, fish can also be drizzled in CBD oil after cooking.

Another fatty ingredient that CBD binds easily to is avocados. These fruits are becoming increasingly popular, and the number of avocado-based dishes available have soared. When you are making guacamole as a spread or dip, why not swap out your standard recipe for a CBD-infused one? Adding a few drops of CBD oil to your homemade guacamole is a simple way to incorporate CBD into any dish, while keeping the contents cold during preparation. To make this CBD-infused guacamole, all you will need is avocado, onion, tomatoes, lime juice and CBD oil. Similarly, you can add the oil onto avocado on toast and top with some slices of egg to further increase the content of healthy fats.

Drinking the supplement

One of the easiest ways to begin to include CBD into your diet is to make your own drinks. Smoothies are a perfect solution to consuming the supplement, keeping its temperature low, adding beneficial ingredients for CBD absorption and offering many options for experimenting with taste combinations.

Because the CBD compound cannabidiol is hydrophobic – meaning it doesn't mix well with water – drinks that have an oily or fatty ingredient in them work better. As well as enabling you to choose which extra nutrients you add to your diet, in the form of juices, fruits, vegetables and grains, smoothies can be whizzed together quickly so that you can drink your CBD drink instantly.

The CBD that is added to drinks is incorporated in two ways: mixing it into the ingredients or leaving it to infuse. CBD-infused drinks can take up to an hour to be ready, as you need to let the ingredients mix together naturally in a still container. A few drops of CBD oil can be added to any beverage to experiment with flavourings and find your favourite combination.

Although they are typically hot beverages, you can add CBD to your daily cup of tea or coffee. This will work well if you add milk to your brew. However, one thing to remember when doing this, is to add the oil to the milk beforehand and wait until the water drink has cooled slightly before adding the CBD-steeped milk. You should never add boiling water to the CBD oil directly, as this causes many of the active compounds to dissipate.

Mixing oils

CBD oil works well as a replacement oil in a recipe, but combining it with another form of cooking oil helps your body to absorb its nutrients. CBD is fat-soluble, meaning that when it is mixed with another vegetable oil, the body can take up more of it.

Mixing CBD with coconut oil is one of the most successful choices, as coconut oil has a saturated fat content over 80 percent. This is high in comparison with other oils, such as olive oil, which contains less than 20 percent. Any recipe that involves coconut oil will usually require you to simmer it on a low heat, as this oil can burn more easily than others. When using other oils that have a significantly lower fat content, you will need to use more CBD to make sure that enough of it binds with the oil. Without doing this, it is likely that your body will absorb less.

Images Getty

Cooking, drizzling or baking

CBD oil often has a strong earthy flavour and produces a bitter taste when it is consumed alone. But cooking with the product and complementing it with other ingredients not only enhances the more desirable flavours, but it also enables you to tailor your food to meet your taste preferences. Some CBD oil is already filtered to remove some of the hemp plant's lipids and chlorophyll that is responsible for the strong aftertaste.

If you are cooking with unfiltered CBD oil, you may need to add it to dishes with stronger flavours to disguise or counteract some of the aftertaste. But, drizzling the oil over meals after cooking is a simple solution if you are using filtered CBD. Filtered CBD oil won't alter the taste of a food product too much, and can quickly be contributed to any dish as a late addition.

Finally, baked goods can be enjoyed with a dash of CBD. Not only does this give your sweet treats a unique flavour, but it means the distribution and consumption of CBD oil can be easily monitored. Baking always requires precise measurements during preparation, so as long as the mixture is properly stirred and combined, the CBD content in each of the cakes, cookies or other items that you have produced can be easily determined. This makes it easier for those who have a daily dosage goal – because baked goods are often sweet, their consumption is regulated separately to a main meal, which can vary in volume much more.

The typical ingredients used in baking usually involves a fat-rich product, helping with bioavailability. The CBD oil should be added to the baking mixture along with all the other wet ingredients.

Pairing flavours with CBD

With the possibility of adding CBD into any food, how can you discover the best taste combinations? There are many flavour profiles that pair well with CBD, such as citrus, chocolate and spicy flavours. However, to truly explore which foods your palate prefers, experimenting with cooking is part of the fun for many.

One staple meal in many people's diets is pasta. And there are some sauces that generally complement CBD better than others. Pesto is one such sauce, as it is packed with earthy herbs and nutty flavours to subtly blend with the flavours of CBD. Another perk of cooking CBD with a pesto sauce is that not too much heat is required. Just enough can be applied to mix the two tastes and bind the consistencies before it is time to eat.

CBD oil can come in different flavours, making it easier to match the oil with baking ingredients that you are familiar with. Some common oil flavours are mint, orange and lemon. While some CBD oils contain overpowering flavours that people try to cover in the kitchen, these flavoured varieties can be enhanced with complementary flavours. For example, you may wish to combine the mint-flavoured oil with a chocolatey ingredient to make mint chocolate cookies.

Generally speaking, sour-tasting CBD oils pair well with sweet foods to balance out the palate, while citrus-flavoured CBD oils suit fruity recipes. CBD flavourings can be chosen to match specific flavours in savoury meals, too. For example, citrus oils can match the specific flavours of a lemon chicken dish, or another meal with a similar flavour incorporated. If using unfiltered and unflavoured CBD oil, the best way to match a dish is to use the oil with ingredients that have an existing grassy, nutty or earthy flavour.

Experimenting with CBD cooking can provide some intriguing tastes, but when you find the perfect combinations for you, adding CBD into your daily diet will become an easy habit and a flavour enhancer.

Images Getty

CBD SMOOTHIE

You can try this recipe to kick-start your CBD-cooking journey

If you are looking for inspiration to make your first CBD creation, or simply need ideas for a new way to incorporate CBD into your diet, this simple recipe could be your solution. For the smoothie, you will require a blender and will need to source the ingredients, however some of them can be swapped for similar alternatives so you can make your ideal CBD smoothie.

This smoothie is a great way to fill you up with essential nutrients, antioxidants and CBD. For the best results, the smoothie should be prepared at the time you plan to drink it, but it will keep in the fridge for around one day. If you store it in the fridge for a while, you might notice the ingredients start to separate as it is made with foods of different densities. If this happens, simply re-blend the drink to make sure that the CBD is evenly distributed.

Ingredients

- **½ tsp CBD oil**
- **1 mango**
- **1 banana**
- **½ cup strawberries**
- **1 cup vanilla almond milk**
- **4 ice cubes**
- **1 tsp honey**

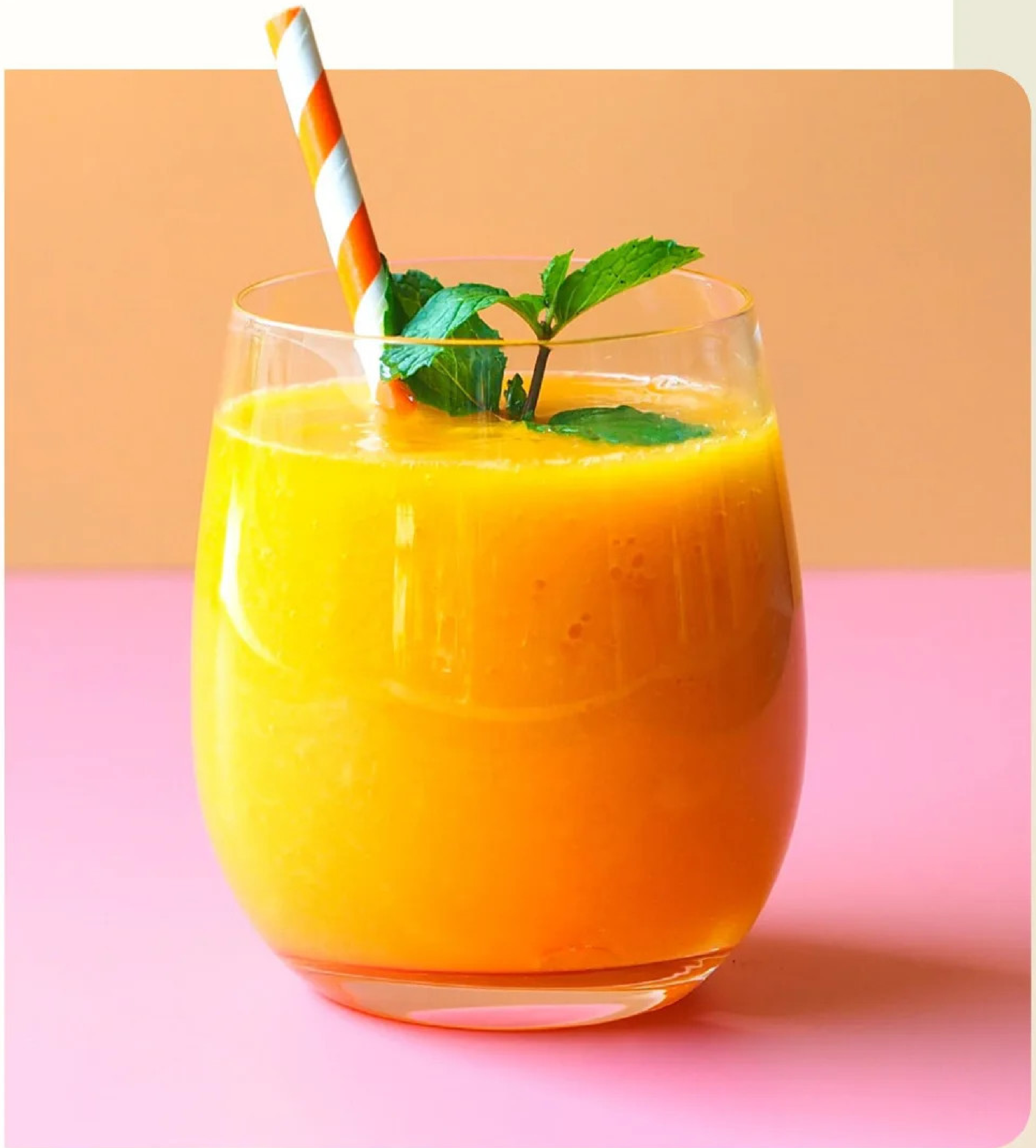
Instructions

① Firstly, you will need to chop up all of the fruit so that the pieces are small enough to fit into your blender.

② Add the mango, banana, strawberries, almond milk and ice into the blender and blend until smooth.

③ Now add the CBD oil, along with the honey and blend until the oil has been distributed throughout the mixture.

④ Turn off the blender and pour the smoothie into a glass. It is ready to serve.



A GOOD NIGHT'S SLEEP

Why we find it difficult to sleep and what we can do about it

WORDS BY **EDOARDO ALBERT**

From being the poor relation of physiological research, sleep investigators have moved into the mainstream. Scientists investigating the mysteries of what happens during our night visits to Morpheus's realm have conclusively shown that sleep is vital for our health and wellbeing. Of course, this is exactly what all ancient cultures believed and practiced, but it had become lost in the neon frenzy of the 20th century. Macbeth, lamenting the guilt that prevented his own rest, summed up the ancient view of sleep in these memorable lines:

Sleep, that knits up the
ravell'd sleave of care,
The death of each day's life,
sore labor's bath,
Balm of hurt minds, great
nature's second course,
Chief nourisher in life's feast.

Macbeth was right. Sleep restores the body and the mind. It fixes and consolidates memories, enhances the immune system and helps to regulate calorie uptake, acting against excessive weight gain. Lack of sleep increases the risk of heart disease, stroke and the neurodegenerative disorders of old age. Staring at the ceiling in the middle of the night exacerbates depression and increases inflammation in the body. In short, sleep is good for you. But despite this, the NHS estimates that a third of the

"LACK OF SLEEP INCREASES THE RISK OF HEART DISEASE AND STROKE"

population in the United Kingdom regularly struggle with insomnia.

Why sleep is more difficult today

Despite our increasing knowledge of the importance of sleep, more and more people are finding it difficult to get enough rest at night. In large part this is because the civilisation we have created could almost have been designed to make sleep difficult. Artificial lights upset the body's natural circadian rhythm, hindering the natural wind down when the sun sets. We organise our working days by a clock that has no regard to the moving of the seasons. And we inhabit an always-on virtual world, where screens flare and message alerts buzz, throughout the day and the night. All of these stimuli work to switch the body out of the natural rest/digest state it needs for sleep and, with the high levels of stress so many of us labour under continually, into a nigh permanent state of nervous arousal. Cortisol, the stress hormone, floods the body, preventing the relaxation necessary for proper deep sleep. Instead, we twitch on the borders of consciousness, unable to sleep properly, and come groggily awake with few of the benefits of restful sleep.

What we can do to sleep better

The medical advice on this is consistent and sensible. Adopt a regular bedtime routine – irregular sleep times are the enemy of sleep. Avoid stimulating drinks for at least a couple of hours before bedtime. Some people can be highly sensitive to stimulants like caffeine, so if sleep is still proving elusive, try quitting caffeine completely for a few weeks to see if that makes a difference. Make sure your bedroom is dark, quiet and cool. Switch off all devices an hour before bedtime.

If simple sleep hygiene habits are insufficient to solve the problem, then there are a range of psychological and meditative techniques designed to aid

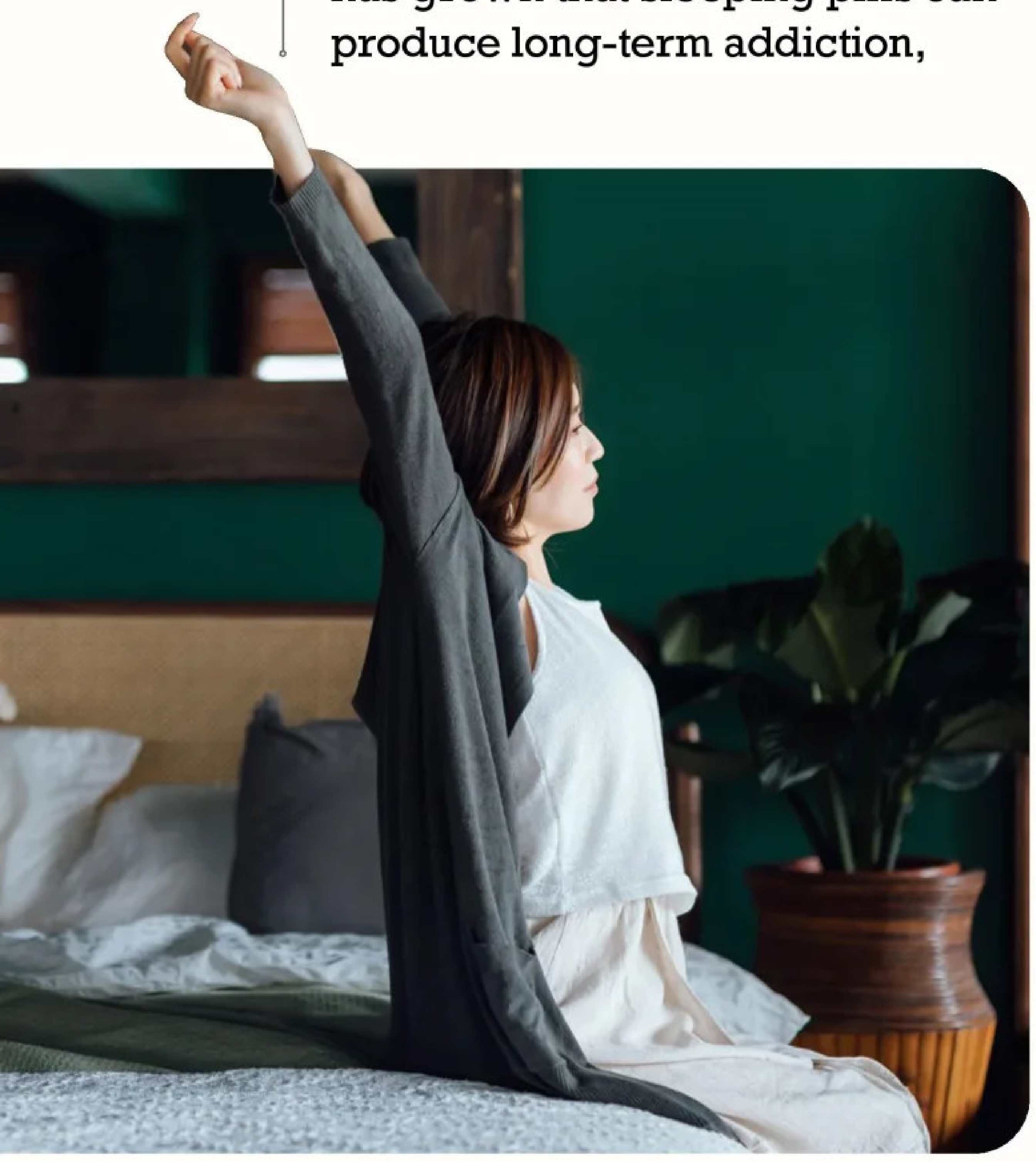
Image Getty

relaxation in preparation for sleep. These include cognitive behavioural therapy, which can be very helpful in reducing the anxiety about sleeping that prolonged insomnia can produce, and various types of relaxation exercises, including meditation, biofeedback and calming breathing exercises.

In most cases, following these procedures will reduce or remove insomnia completely. However, there is a significant sub-section of the population who find that none of these techniques work for them. In such cases, there are often other factors that make it more difficult to sleep. These can include chronic pain – no one finds it easy to sleep when their back screams every time they move – and the sort of chronic anxiety that repels all efforts to relax.

Alternatives to sleeping pills

In these cases, doctors used to prescribe sleeping pills. Sleeping pills are certainly effective in forcing the body to sleep but they should only be used for short periods of time. As the realisation has grown that sleeping pills can produce long-term addiction, doctors have become increasingly reluctant to prescribe them, and rightly so. But that leaves little option for long-term sufferers from insomnia other than being referred to a specialist sleep clinic, which is usually a long-winded process.

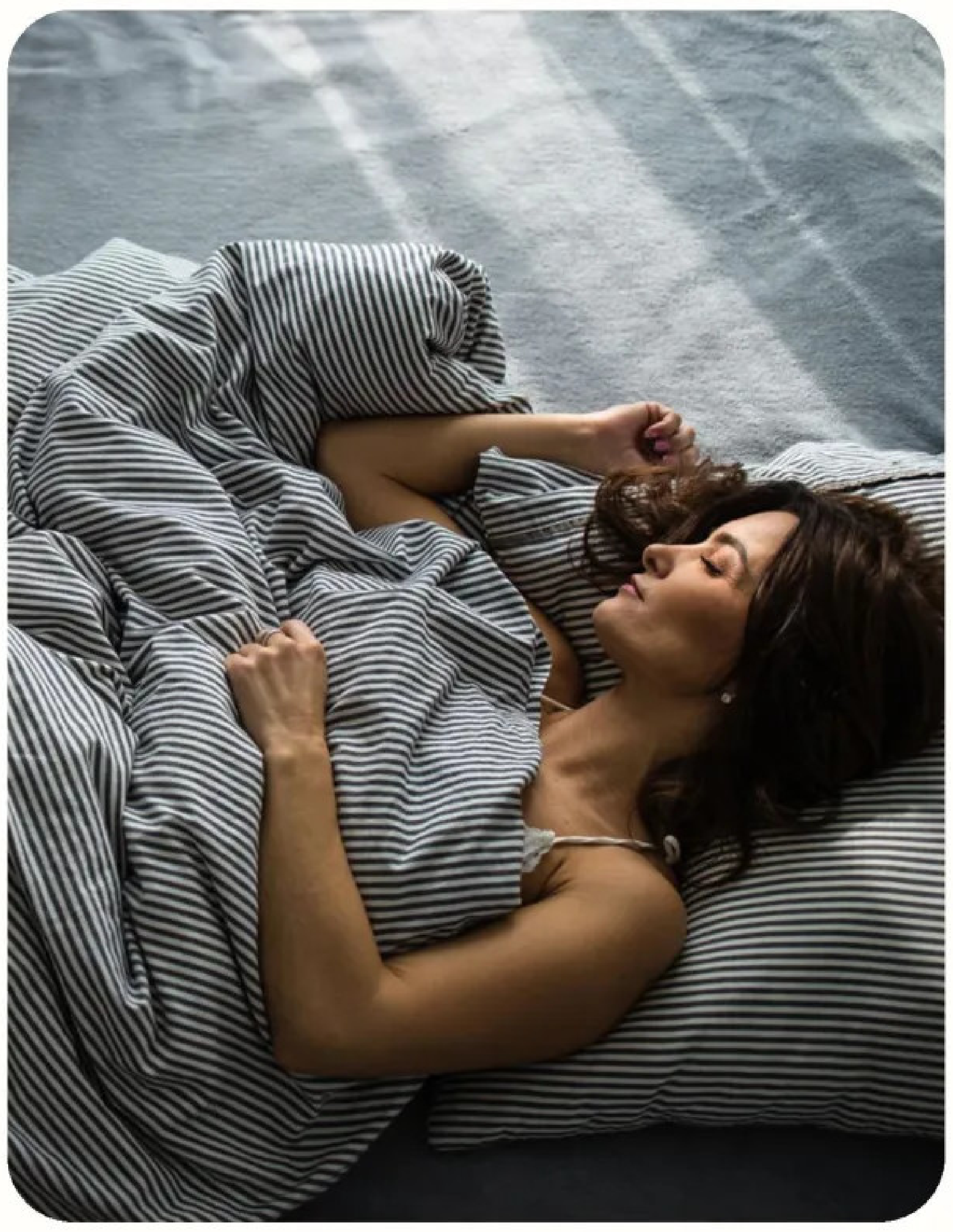


In the meantime, many sufferers from insomnia have been looking for other ways to relieve their sleeplessness and, not surprisingly given its ubiquity, some have turned to CBD preparations for a solution.

The endocannabinoid system and sleep

Although work on this is in its infancy, it's becoming clear that the endocannabinoid system plays as important a role in sleep regulation as it does in so many of the body's other maintenance systems. Most of the research on the effects of cannabis on sleep has looked at THC rather than CBD, in particular the synthetic variety of THC used in the anti-nausea drug Nabilone. With respect to the effects of CBD on sleep, the published research is contradictory and, frankly, confusing. Animal studies on rats have produced opposing results, with one set of rats becoming more wakeful when CBD was introduced into the lateral hypothalamus in their brains, while another set of rats had an increase in the sleep hormone adenosine from CBD in the same area of the brain. Further animal studies have only increased the confusion, with some studies finding that CBD promotes sleep while others found exactly the opposite.

There have been disappointingly few studies on the effects of CBD on sleep in humans. A small study of people with Parkinson's found that CBD helped them to sleep, as did another on people whose insomnia was a result of anxiety. This is quite promising, as many of the most stubborn cases of insomnia are related to high levels of anxiety. Studies on Sativex, the 1:1 mixture of THC and CBD approved for the treatment of muscle spasms in people with MS, have shown that it helped people with MS sleep better as well as alleviating their other symptoms. What's not clear, however, is whether the sleep improvement was actually due to the improvement in their other symptoms of MS.



The most obvious avenue by which CBD might help people with insomnia is in those for whom anxiety or chronic pain is a major cause of sleep deprivation. In such cases, reducing the anxiety or the pain will allow the other methods of inducing sleep already mentioned to actually work. While the published research on this area is sparse and contradictory, there are many anecdotal accounts of people experiencing a transformation in their sleeping routines as a result of using CBD.

If you are trying CBD for the first time to help with sleeping, remember that it is always best to start with a low dose and monitor its effects before moving to higher doses. Be aware that, in some cases, CBD makes people more alert: this is not an area where CBD is a magical sleep bullet.

BEST BUYS FOR SLEEP

Products to help you get those precious eight hours

1 Evopure Sleep Broad Spectrum CBD Oil

£32.99
evopure
Sleep
500mg CBD
10ml

Many insomniacs swear by Evopure's specially formulated CBD oil. It's a broad-spectrum oil, the THC removed by the gold-standard CO_2 extraction process, obtained from organic hemp grown in Colorado. The formulation also contains passion flower extract, which is a long-standing herbal relaxation remedy, and a range of anti-inflammatory terpenes. It's probably the best CBD sleep product on the market.
evopure.co.uk

2 Pzizz

Free to try. Annual subscription £44.99

This NHS-recommended app is free to try with access to its classic mode, and then available on annual (£44.99/$49.99) or monthly subscription (£6.99/$7.99). It's simple to use, having just three modes, sleep, nap and focus (that one is to help with concentration). All three modes are achieved by the soundscapes composed by a team of engineers and developers to induce the relaxation required for sleep. The free classic version is an excellent way to decide if it's for you.
pzizz.com

3 Dreem Distillery CBD Anchoring Bath Soak "The Z's"

£80.00
Dreem Distillery
The Z's

One of the best ways of ensuring a good night's sleep is a properly relaxing bath before bedtime. Dreem Distillery's CBD-based bath salt does just that, its combination of Epsom and Himalayan salts complementing the CBD to combat inflammation and reduce muscle aches and pains. It smells pretty good, too.
dreemdistillery.co.uk

Prices and availability correct at the time of publication.

Stock Images Getty

CBD & YOUR SKIN

How CBD can help a wide range of skin complaints and combat the effects of ageing

WORDS BY **EDOARDO ALBERT**

Image Getty

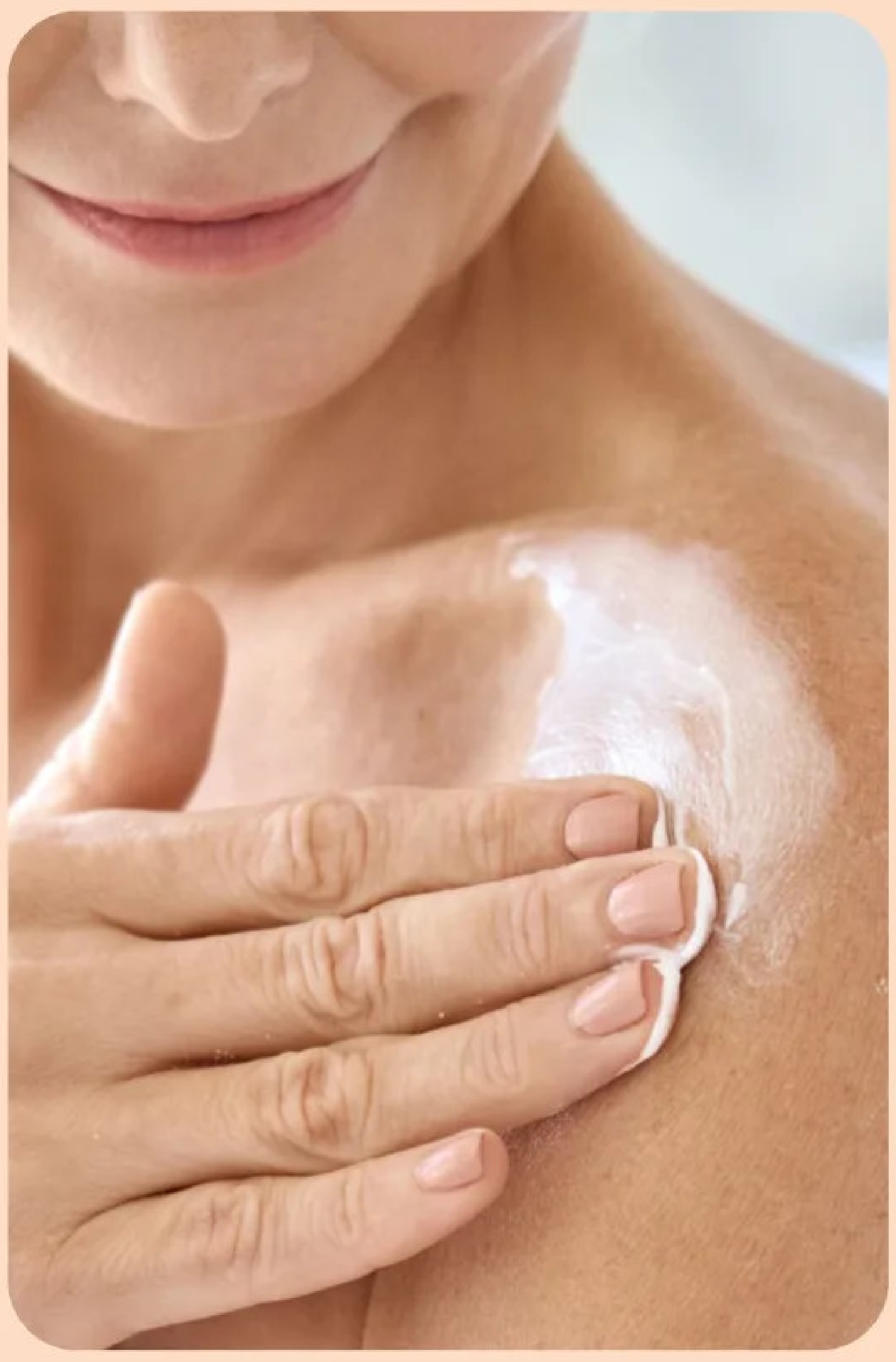
Having discovered receptors for the endocannabinoid system throughout the body, it shouldn't have been a huge surprise when they were also discovered in the skin. After all, the skin is the largest organ in the body. But nevertheless, to find cannabinoid receptors in all of the cells that make up the skin came as something of a shock to the researchers.

On reflection, its presence in the skin is logical. The endocannabinoid system is intimately involved with the body's regulatory systems and the skin is the organ whose primary function is regulation, keeping the inside in and the outside out – apart from those substances we need to absorb and those we need to get rid of.

Within the skin, the endocannabinoid system appears to be involved in regulating its key functions, including the maintenance of the skin as a barrier between inside and outside, inflammation in the skin and the growth of the different kinds of skin cells.

Given that many of the most common and annoying skin conditions – eczema, psoriasis and acne – have as part of their cause a failure in the proper regulation of the skin, then on the face of it, topical creams containing cannabinoids such as CBD could well have a part to play in treating them. However, there are as yet disappointingly few published studies on the effects of cannabinoid treatments on these skin conditions, and none at all that look at dosage and product.

What we do have are extensive anecdotal reports and case studies where people suffering from various chronic skin conditions have treated themselves with CBD topical creams and ointments, sometimes with excellent results.



Psoriasis

Psoriasis is a disease of inflammation so CBD, with its anti-inflammatory properties, might be hoped to be effective in tackling its symptoms. For sufferers, psoriasis is a nasty condition that can often cause them great embarrassment as well as considerable discomfort. It results from an imbalance in the upper layer of skin cells – the keratinocytes. This produces the characteristic psoriasis plaques on the patient's skin. These plaques are red or pink and scaly and, in some cases, so unsightly that sufferers avoid company because of the reactions their condition provokes. Although psoriasis is not contagious, people often shy away from sufferers, adding social isolation to the physical burden of itching and irritation.

There is no cure for psoriasis and the main medical treatments can produce unpleasant side effects in some people. So any alternative treatments would be very welcome. An integrated approach that examines other possible causes of chronic inflammation, such as leaky bowel syndrome, is helpful when dealing with psoriasis but it's not always possible to find a doctor who will do this. When self-treating psoriasis with CBD ointment, bear in mind that as yet we do not know what dose or which product is most effective. The best approach is to first soften the psoriasis plaques by soaking them in warm water containing Epsom salts or oatmeal and olive oil. Once the plaques are softened, generously apply a CBD ointment formulated for extra skin absorption twice a day. It's best to use a full- or broad-spectrum ointment, as studies have indicated that some of the other cannabinoids present in the source hemp may also help against psoriasis.

> "ANYONE WHO HAS SUFFERED FROM ECZEMA WILL KNOW THE MADDENING ITCH THAT ACCOMPANIES THE CONDITION"

Eczema

Anyone who has suffered from eczema will know the maddening itch that accompanies the condition. It's a result of inflammation in the skin, which also produces dry, inflamed skin that, in severe cases, can crack and bleed. The extreme itchiness only exacerbates matters. In fact, the itching can become so overpowering that it has to be treated by anti-itching drugs.

Eczema is another condition for which there is no specific cure, although it often improves with age. Standard treatments are moisturising creams applied daily to stop the skin drying and steroid creams during flare-ups. However, recent research suggests that failures in the endocannabinoid system may be a cause for eczema. The only research so far on whether CBD can help eczema has been done on cells and mice but it did indicate that CBD may be helpful in treating eczema.

With respect to self-treating with CBD, so far no work has been done on what are the best products or the best ways to use the creams and ointments available, although there have been plenty of reports of them proving useful. As with psoriasis, a quality, broad-spectrum product formulated for absorption would probably be best, applied twice a day. But as anxiety is often a trigger for eczema flare-ups, it might be worth considering taking CBD orally as well to help with this.

Acne

We all – well, nearly all of us – remember acne. No surprise, given that it's the single most common skin condition. Of course, in the majority of cases it's mainly a problem during adolescence, slowly disappearing as the hormone cascade of those years slows down. But in some people it remains a long-term problem. And while it might be all very well telling a teenager whose face resembles a pizza that everything will be all right in a few years' time, that probably won't wash with said teenager for whom even the next month seems unimaginably distant.

Acne is a multi-faceted condition involving too much production of the skin oil, sebum; inflammation; accumulation of the acne bacterium, Cutibacterium acnes; and irregular shedding of skin cells. As such, no single treatment will prevent it, and most current medical treatments involve targeting the bacteria or using retinoids to target the skin irregularities. However, longer-term use of antibiotics promotes bacterial resistance and retinoids can become toxic in high doses, so a natural remedy with fewer side effects would be very useful. Which is where CBD comes in.

As we've seen, acne causes skin inflammation and we know that CBD is an anti-inflammatory. Recent research shows that when applied to acne-ridden skin, CBD acts to reduce inflammation, suggesting that it will be helpful in treating the condition. However, given the changes that occur in adolescence, further research is needed to ensure that using it won't affect the growing body. For adults with acne, however, CBD has its place among other treatments, with reportedly good results. The best way to proceed would be as for psoriasis and eczema: a good-quality cream, full- or broad-spectrum, formulated for skin absorption and applied to the affected area twice a day.

Dry skin

Many people endure dry skin throughout their lives, but it is also a condition that can be brought on by ageing, as the skin slowly loses its youthful vigour. The wrinkles and sags of age are down to the skin losing its elasticity and succumbing to gravity, in addition to the repeated patterns of our customary expressions. However, studies indicate that CBD may be able to rehydrate dry skin, while also playing a role in regulating the production of the skin oil, sebum.

As already mentioned, in young people the overproduction of sebum can lead to acne, but as we age, the skin can produce too little sebum. It is possible that CBD may be able to aid here too, stimulating sebum production where there is too little. As with all the other uses of CBD for skin conditions, it's best to use a quality broad-spectrum product that has been made to facilitate its absorption by the skin.

Images Getty

10 OF THE BEST SKINCARE CBD BUYS

Some of the best products to alleviate skin diseases and make your skin glow

1 Evopure Organic CBD Balm

Evopure's broad-spectrum CBD Balm is among the very best products on the market. The company manufactures all its balms in the UK from organically grown hemp that is harvested to retain other useful cannabinoids and terpenes even when the THC has been removed. Along with the CBD, the balm contains peppermint to reduce irritation; wintergreen oil for its anti-inflammatory properties; eucalyptus oil, which is anti-inflammatory and antibacterial; and candelilla wax, which helps to hydrate the skin.
evopure.co.uk

2 Green Roads Skin Relief Cream CBD Infused Topical

Green Roads, a high-quality American brand that is now available in the UK, specifically targets the dry, red, itchy skin that is characteristic of eczema by combining CBD extracted from organically-grown hemp plants with vitamin E and avocado oil. It's a soothing, calming cream that leaves no residue and which has many customers enthusing about its effects.
flawlesscbd.co.uk

3 Canamis CBD Acne Control Gel

Canamis's Acne Control Gel has many previously desperate parents to teenagers writing of how it has brought relief from tears and tantrums as their teen's previously uncontrollable acne comes under control. It's a CBD isolate, indicating that the anti-inflammatory properties of CBD on its own can be helpful in controlling spots, but Canamis combines it with aloe vera, sea buckthorn oil and tea tree oil to further target the inflammation and infections that produce acne.
canamis.com

4 Vitality CBD Infused: Dry Skin Cream

Vitality, one of the key CBD manufacturers in the UK, has produced this excellent value CBD cream expressly formulated to help in the relief of dry skin. Its CBD comes from organic hemp grown in Colorado, which is combined with an extract from the South American cherimoya plant and stem cells to help protect and firm dried out skin cells. You only need a pea-sized amount of the cream, massaged gently into the skin, morning and evening.
vitalitycbd.co.uk

5 The Body Shop CBD Soothing Oil-Balm Cleansing Mask

The Body Shop's CBD cleansing mask can be used in two ways. As a mask, by slathering it on and leaving it for five to ten minutes, giving it time to work

1 £29.99
2 £28.00
3 £22.00
4 £19.99
5 £20.00
evopure
Relief CBD Balm
GREEN ROADS
SKIN RELIEF CREAM
200MG CBD
CANAMIS
ACNE CONTROL GEL
vitality CBD Infused
dry skin cream
THE BODY SHOP CBD
SOOTHING OIL-BALM CLEANSING MASK

into the skin, or in smaller quantities as a face wash. Along with the CBD, the lotion contains essential fatty acids, vitamins A and E, and glycerin and squalene. Being a Body Shop product, you can pick it up from one of the chain's many stores as well as online.
thebodyshop.com

6 Wild Science Root + Fruit Control Switch Repair Serum

Wild Science, a British manufacturer, concentrates on creating products that combat the ageing effects of our environment, particularly pollution and sunlight. Along with CBD, the serum contains moth bean, a plant-derived alternative to retinol that helps the skin produce collagen and fosters cell regeneration. The serum is the colour of butter when you squeeze it out of the tube and it's not the quickest absorbing cream; try patting it gently to help absorption.
wildsciencelab.com

7 Kloris: The Eye Cream

Kloris integrates its products with the research of leading plant scientists, which leads to some surprising but effective new combinations. In this eye cream – winning rave reviews from customers – the bonus ingredient is Chaga mushroom extract, included because of its efficacy in reducing dark lines under the eyes and helping with the production of collagen. It's also particularly effective in helping people who suffer from weeping eyes as a consequence of hayfever.
kloriscbd.com

8 NYX Professional Makeup Bare With Me Cannabis Sativa Seed Oil SPF 30 Daily Moisturising Primer

NYX's moisturising primer makes the ideal base underneath make-up as it is completely clear, and is also an excellent moisturiser for the skin, thanks to its constituent hemp oil. In fact, many users claim dryness is eliminated after a day. It also helps protect against redness and freckles courtesy of it sun protection factor 30 anti-UV agent. While it's perfect for use under make-up, an application leaves the skin fresh and glowing, so you might end up deciding to let your skin go naked after all.
nyxcosmetics.com

9 European Hemp Santa Maria Topical CBD Collagen Face Cream

European Hemp claims that its products come from the place where 'nature meets science' and to that end, they are all derived from organic and plant-derived sources – no artificial ingredients sneaking in with the small print. Along with the broad-spectrum CBD oil in its face cream, European Hemp includes collagen, organic propolis, organic jojoba oil, vitamin E and wild honey to give the cream an exquisite smell. If you like the face cream, you might well like European Hemp's lip balm, too.
europeanhempcompany.com

10 Swiss Peak CBD Face Cream

Swiss Peak grows its hemp in, naturally enough, Switzerland and extracts the CBD using the CO2 extraction process, which leaves no residual solvents behind (because the CO2 all evaporates), making it the gold standard method of extraction. To support the action of the CBD, the face cream also contains collagen, to help retain moisture; leaf extract from the common comfrey plant, a traditional herbal medicine; as well as the anti-inflammatories, ginseng, chamomile and lavender.
swisspeakcbd.com

6
£35.00
ROOT + FRUIT
CONTROL SWITCH
Repair Serum
300MG PURE CBD + MOTH BEAN SEED
Clarify, calm and rejuvenate skin texture
Sérum Réparateur
WILDSCIENCE COLLECTION
30 ml 1.01 fl oz
7
£42.00
KLORIS
LET NATURE LOVE YOU
THE EYE CREAM
CBD, HYALURONIC ACID & CHAGA MUSHROOM - 15ml (0.5 fl oz)
8
£15.99
NYX PROFESSIONAL MAKEUP
BARE WITH ME
HEMP | CHANVRE
HIGH PROTECTION SPF30
HAUTE PROTECTION FPS30
2.5 fl. oz. / 75 mL
9
£41.97
EUROPEAN HEMPCO
SANTA MARIA
TOPICAL CBD COLLAGEN FACE CREAM
10
£27.99
SWISS PEAK CBD
FACE CREAM
1oz - 50ml - 350mg

Prices and availability correct at the time of publication.

WHAT CAN CBD DO FOR MY HAIR?

Word hasn't really gotten out yet, but CBD can do amazing things for the scalp and hair

WORDS BY **PETE WISE**

> "MANY OF THE BENEFITS OF CBD ARE ROOTED IN THE VITAMINS AND MINERALS"

Imagine if the solution to all your haircare quandaries was as simple as CBD. An increasing wealth of user testimony suggests this just *might* be the case.

There are many reported benefits to using CBD on the hair, including stronger follicles, reduced inflammation of the scalp, and improvement in skin conditions such as dandruff. Some studies suggest that CBD hair treatments might even reduce thinning and stimulate new hair growth.

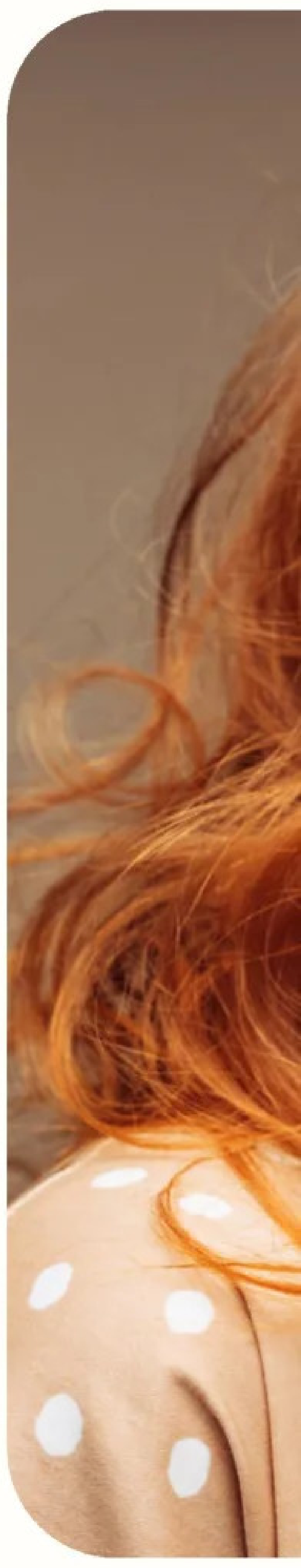
A huge variety of CBD hair products have launched in recent years, as haircare brands and their customers have become more aware of CBD's apparent benefits. There are CBD shampoos, conditioners, hair oils, dry shampoos, hair masks and more. So, adding CBD to your haircare routine can be as simple as switching to a new shampoo.

Many of the hair health benefits of CBD are rooted in the abundance of vitamins, minerals and amino acids that make up the CBD compound. CBD is notably rich in amino acids, particularly leucine, tyrosine and valine. These so-called 'building blocks of proteins' are crucial when it comes to healthy hair growth, strength and structure. The vital amino acid valine may be particularly well suited for absorption into the hair follicles, as it has a low molecular weight. CBD also contains vitamin B12, which helps the body to metabolise amino acids and create new hair cells, as well as vitamin E, an antioxidant which helps to promote good scalp health.

It's clear that CBD is full of good stuff that could nourish the hair and scalp – but that doesn't mean you can believe every claim that you read about CBD's hair-healing powers. There hasn't been very much peer-reviewed scientific research into the effects of CBD products on the hair, and the few studies that you can read online will often have been commissioned by CBD brands, or by organisations that are interested in promoting CBD and other cannabis products.

Some of these studies do show very encouraging results, though. In a survey of customers who used Love, MeMeMe's CBD hair mask, 'Good Hair, Don't Care', 95 percent of respondents said their hair felt stronger, shinier, healthy, bouncy and easy to manage. Perhaps even more strikingly, a study commissioned by the Research Society on Marijuana (RSMj) indicated that applying appropriate CBD oil products to

Image Getty



the scalp could stimulate hair growth, leading to "a statistically significant 93.5 percent increase in hair after six months".

Some experts believe this happens because CBD stimulates the development of new hair cells. However, RSMj's study also seemed to show that using too much CBD could cause hair cells to prematurely enter the 'catagen' phase of their lifecycle, at which point they stop growing longer. So, CBD can promote hair growth – but the benefits may stop if you apply your CBD product too liberally.

It's probably a good idea to treat the findings from CBD studies with a degree of scepticism. This is especially true in the case of hair loss and thinning, both of which can be affected by factors beyond CBD's influence, such as genetics. It's also worth bearing in mind that some of the benefits of applying CBD to the hair – eg improved circulation – could also be achieved through taking an oral form of CBD product that provides a more reliable dose, such as CBD oil or CBD spray.

If you're new to CBD, you may have some concerns about applying this unfamiliar chemical to your hair. The reassuring fact of the matter is that CBD is a natural ingredient – just as natural as mint, rosemary, or any other herb you might use in your bathroom products. CBD is often produced organically, and in these cases the product listing and packaging will usually show an organic certification mark.

Also, it's not just the cannabis plant that naturally produces cannabinoids such as CBD. Our bodies make similar chemicals, called 'endocannabinoids', which regulate a huge range of bodily functions including sleep, mood and metabolism. When we use a CBD hair product, we're not really adding some exotic new ingredient to our biochemistry – we're contributing extra cannabinoids to our existing bodily balance.

Some people appear to be deficient in endocannabinoids, and for these folk, using CBD could be key to maintaining healthy endocannabinoid function. In any case, you can be safe in the knowledge you're applying something natural to your hair, provided that you're using a reputable CBD hair product in reasonable quantities. Just apply a relatively small amount of the product the first time you use it, to make sure you're not one of the very few people who have a CBD allergy (possibly relating to histamines or pollen from the hemp plant).

One thing we can say for sure about CBD hair products is that there are lots of people out there who are using them, and many users are seeing positive results for their hair. The glowing customer reviews left on many online CBD haircare product listings speak for themselves.

To really understand whether CBD could be helpful for your hair, the best thing you can do is try a few products, and then observe the effects over a period of sustained use. There are some brilliant CBD shampoos and conditioners out there, ranging from reasonably priced options to salon quality. Or, if you want to apply CBD using a separate treatment, you could go with a CBD hair oil or hair mask. As well as containing CBD, most CBD hair products provide additional ingredients that can do great things for your hair, such as walnut oil (which is rich in omega-3), coconut oil (moisturising and anti-frizz) or activated charcoal (cleansing). You may notice some good effects from these other ingredients too.

There is some debate over which type of CBD hair product

> "THE GOOD NEWS IS THAT MANY USERS OF CBD HAIR PRODUCTS GIVE EXCELLENT FEEDBACK ON THEIR EXPERIENCE"

will deliver the best rate of CBD activation in the hair and scalp. It seems as though products that are massaged into the scalp and hair – rather than ones that are immediately rinsed off – may provide the strongest absorption of CBD and all the other nourishing ingredients.

Speaking of nourishing ingredients, it's worth noting that CBD hair products vary widely in their level of CBD content. As with other types of CBD product, the amount of CBD is measured in milligrams (mg). We've seen products ranging from about 50mg to 1500mg per unit/container, which is a vast difference in dosage, regardless of whether you're using a hair oil, shampoo, conditioner or a hair mask.

Some CBD brands misleadingly measure their products' CBD content in micrograms, which are one-thousand times lighter than milligrams. If you find a shampoo that has an advertised '1500mcg' of CBD per bottle, this means it contains only 1.5mg, which isn't enough to have any significant effect. You should be looking for a hair product which has a relatively generous level of CBD, in order to get the specific hair strengthening and stimulating effects that CBD seems to provide.

We're only just beginning to understand how CBD affects human beings, from tip to toe. In fact, the body's endocannabinoid system was only discovered in 1988 – a very short time ago, in terms of scientific understanding. It's natural that research into the effects of CBD hair products is still thin on the ground.

The good news is that many users of CBD hair products give excellent feedback on their experience, and the benefits they report often correlate with known facts about the CBD compound. Many users say CBD hair products have given them stronger follicles with less breakage – and this would make sense, given the abundance of amino acids contained in CBD. Some report better growth, which could result from a number of factors, including CBD's content of B12, a crucial vitamin that the body needs in order to grow new cells.

You've got very little to lose by trying some of the excellent CBD hair products that are available today – and it seems like there could be some amazing hair benefits to gain.

Images Getty

10 OF THE BEST HAIRCARE CBD BUYS

CBD hair products range from affordable to luxurious, and there are options made for various tastes, conditions and hair types. Here are some of our favourites...

① Wild Science Leaf + Seed Head First Scalp Relief Shampoo

This deeply nourishing shampoo provides 120mg of CBD per 300ml bottle, along with a host of other health-boosting ingredients including organic aloe vera, magnolia oil, hemp seed oil and benzoin. As its name suggests, the Head First Scalp Relief shampoo is designed to soothe the scalp – especially in the case of conditions such as inflammation, seborrheic dermatitis and psoriasis. The aim is to promote good scalp health, stronger hair and better conditions for hair growth.
wildsciencelab.com

② Eneschi Intense Hair Serum

Here's a handy option to add an intensive CBD treatment to your haircare routine. The Intense Hair Serum from Eneschi is loaded with 1000mg of CBD per 30ml bottle. Massage drops of the oil into your scalp, and then into your hair, up to three time a week. This gives you the health benefits of CBD from root to tip. As well as CBD oil, Eneschi's serum contains keratin-strengthening horsetail oil, and nettle leaf oil to soothe the scalp.
naturallycbd.co.uk

③ Naturecan CBD Infused Coconut Conditioner

Fragrant coconut oil combines with CBD in this silky, sweetly scented, shine-enhancing conditioner. With 320mg of broad-spectrum CBD oil per bottle, this product has a very good level of CBD content relative to its volume. Be sure to work the conditioner through your hair thoroughly, as this will make the most of the CBD's beneficial effects. It's not all about the CBD – the coconut oil brings its own moisturising and frizz-fighting qualities, and it smells lush too.
uk.naturecan.com

④ Voyager Clarifying 1000mg CBD Shampoo Bar

Lather your way to healthier hair with this goodness-packed shampoo bar. With 1,000mg of CBD per 100g bar, this is one of the more intensive CBD shampoos you can buy – perfect for promoting a good level of activation. The bar also contains activated charcoal, which is brilliant at cleansing the scalp and removing accumulated product from hair, along with a host of healthy ingredients including sweet orange essential oil, panthenol and tocopherol.
voyagercbd.com

⑤ Herbliz 150mg CBD Hair Oil

A simple, high-CBD solution for treating the hair and scalp, pleasantly scented with lavender. Herbliz's 150mg CBD Hair Oil is the ideal product for users who want to start treating their hair with CBD, without switching their usual shampoo or conditioner. It

1
from £6.00
LEAF + SEED
HEAD FIRST
Scalp Relief Shampoo
120MG PURE CBD
WILDSCIENCE
300 ml 10.14 fl oz
2
£19.99
Eneschi
INTENSE
HAIR SERUM
WITH HORSETAIL OIL & NETTLE LEAF OIL
1000mg CBD
30mle
3
£16.99
NATURECAN
CBD INFUSED
COCONUT
CONDITIONER
4
£10.50
voyager
5
£20.00
150 mg
CBD
50 ml
LAVENDEL
HAARÖL
HERBLIZ
BERLIN

can be used as a hair mask, as a leave-in treatment, or as a hair finish – whichever suits you best. The oil's bouquet of scents mingles lavender, almond, avocado and coconut.
herbliz.com

6 NKD 150mg CBD Hair + Body Shampoo

Developed for men, NKD's Hair + Body Shampoo is richly scented with honey, oud and tobacco leaf. Considering the decent price you pay, this shampoo offers a generous quantity of CBD, with 150mg per 250ml bottle. Every wash delivers a healthy dose to your hair – and since the shampoo doubles up as a body wash, there may be some CBD health benefits for your skin too. This shampoo also contains aloe vera, which adds its own dandruff-busting, inflammation-fighting properties to the mix.
cbdvillage.co.uk

7 Love, MeMeMe, Good Hair, Don't Care CBD Hair Mask

This super-cool hair mask from Love, MeMeMe will lavish your locks with a gorgeous combination of restorative ingredients, including argan oil, almond oil and – you guessed it – CBD. Simply apply the product to wet hair after washing, leave it in for ten minutes, and then rinse off to deliver moisture, vitamins and strengthening fatty acids into your hair. Clinical trials have shown that this hair mask leaves users with the impression that their hair is healthy, shiny and strong.
lovemememe.com

8 Joul'e 150mg CBD Herbal Anti-Oxi Conditioner

Made to professional hair salon standards, Joul'e's pH-balanced, anti-oxidation conditioner offers a luxurious take on CBD haircare. This is the perfect product to use after your hair has been dyed or bleached, thanks to its blend of herbal extracts chosen for their ability to cleanse hair of neutralisers and peroxides. The 150mg of CBD per bottle helps ensure your hair is not only clean, but healthy too, with a strong supply of hair-fortifying amino acids.
glowbarldn.com

6 £13.90
7 £12.00
8 £30.21 for 2 bottles
9 £14.99
10 £3.15

> "SINCE IT DOUBLES AS A BODY WASH, THERE MAY BE BENFITS FOR YOUR SKIN"

9 CBD Armour Ultimate Hair Oil

If you've been struggling with dry or dull hair, CBD Armour's Ultimate Hair Oil could be the perfect revitalising product for you. You can use it as a hair and scalp treatment applied a few hours prior to washing, or massage a few drops into your hair at any time for a little extra TLC. Along with a dose of organic-certified CBD, the product contains a calming and fragrant mixture of mint, walnut oil and camomile.
cbdarmour.co.uk

10 CBD Alchemist Revive Rfrsh Dry Shampoo Citrus

Here's a great on-the-go solution for adding cleansing, nourishing CBD to your hair. This citrus-scented Revive Rfrsh Dry Shampoo provides a gentle hint of CBD, with a relatively mild 50mg per 200ml. Proper application is the key to getting the best out of a dry shampoo like this one, so be sure to follow the instructions carefully – and massage the product into your hair and scalp to maximise the CBD benefits.
tesco.com

Prices and availability correct at the time of publication.

CBD FOR PETS

There's a lot of confusion about using CBD for pets. We clear that up

WORDS BY **EDOARDO ALBERT**

With so many people having found CBD to be of help, it's not surprising that pet owners have started wondering whether their animals would benefit from it too. But would it work for them and more importantly, is it safe?

Animals and the endocannabinoid system

For CBD to affect an animal, we would first need to know whether they actually possess an endocannabinoid system. As the endocannabinoid system in humans was only discovered relatively recently (in the 1980s in fact), we might still be in the dark with respect to animals. But research on this has proceeded quite quickly and the results show that the endocannabinoid system's origins lie very deep in the evolutionary past: the system is present in every species

of mammal. However, the genesis of the endocannabinoid system lies in the first developments of the nervous system itself, long before any mammals existed. Indeed, among animal phyla (phyla come between kingdoms and classes in biological classification, so they are pretty fundamental) only Protozoa and Insecta don't have endocannabinoid systems. So, not only do reptiles, birds, fish and mammals have endocannabinoid systems, but so too do leeches, mussels and sea urchins. Even the hydra (Hydra vulgaris), a fresh-water polyp, which has the simplest nervous system of any creature alive today, possesses an endocannabinoid system.

Considering the ubiquity of the endocannabinoid system, giving pets CBD appears to be a bit of a no-brainer. Unfortunately, it's not quite that simple.

> "THE ENDOCANNABINOID SYSTEM IS IN EVERY SPECIES OF MAMMAL"

Image Getty

The law and CBD for pets

While CBD has been approved in Britain and many other countries for human consumption – providing it is marketed as a food supplement and not a medicine – the situation with respect to animals is more complicated in the UK. The Veterinary Medicines Directorate (VMD), an agency of the Department for Environment, Food and Rural Affairs, has authority over animal medicines. According to the VMD:

- Because of the effects they have, products containing cannabidiol (CBD) should be regulated as veterinary medicines. This means that these products require a marketing authorisation (licence) before they can be sold or supplied in the UK. Currently there are no CBD products authorised in the UK for veterinary use and giving your pet an unauthorised product containing CBD obtained without a veterinary prescription is an offence under Regulation 8 of the VMR.

Put simply, it is illegal to give your pet CBD in the UK. This might seem odd, given that people can take CBD, but the VMD states that it has come to this decision because, while safe CBD dosages have been established for people, no such work has as yet been done on animals. Given the huge differences between species, not to mention trying to work out how much CBD would be appropriate for a Great Dane versus a Chihuahua, the VMD's restriction is understandable.

Nevertheless, this difference in rules can be confusing for pet owners. CBD supplements for pets are legal in the USA and, going online, it's easy to find businesses promoting CBD supplements as suitable for pets. However, any companies promoting CBD products for pets in Britain are not reputable manufacturers. All the responsible CBD companies working in Britain are aware of the law in this area and do not market their products for animal use here.

Your vet and CBD

Although the VMD does not allow pet owners to buy or give CBD products to their animals, it does provide one option for those who think that it might prove beneficial:

- Under the provisions of the veterinary medicines prescribing cascade your vet may be able to prescribe a legally obtained human CBD product, so if you are considering treating your pet with a CBD product, speak to your vet first.

So in Britain, it is possible to give an animal CBD but it must be done under the supervision of a vet and be directly prescribed by the vet. The VMD stipulates this firstly to ensure that animals will not be given dangerous

doses and secondly, because a vet will know if the animal is being prescribed any other medicines and whether the CBD could interact with them to the detriment of the medicine. Because the same enzyme that breaks down CBD also breaks down many common veterinary treatments, including antibiotics and analgesics, giving an animal CBD might mean that its medicines linger longer in its body than they should. In people, this is called the grapefruit effect.

Effects of CBD on pets

While dogs, cats and all other mammals have endocannabinoid systems in the same way that people do, they are not exactly the same. For instance, dogs' brains have a greater density of CB1 receptors than human brains. As a result, THC, the psychoactive component of the cannabis plant, is more potent on dogs than humans. This does not mean that your dog will have a better high – it means that THC is toxic for dogs. As such, any CBD given to animals should not contain any THC at all, meaning that it should either be broad-spectrum CBD or CBD isolate.

While the research on the effects of CBD on animals is at its early stages, there have nevertheless been many anecdotal reports of pet owners finding it helpful for their animals. Given that the endocannabinoid system in higher mammals carries out the same functions as it does in humans, it seems likely that CBD would act as an anti-inflammatory, as well as helping with seizures and reducing pain and anxiety. So far, most research on CBD and animals has concentrated on establishing whether it is safe for animals to take, rather than what effects, if any, it has. The good news is that this preliminary research indicates that CBD poses no danger to animals, so at least it should not do your dog or cat any harm, so long as the dosage is kept within the limits suitable for the size of the animal.

In terms of actually giving CBD to pets, most owners who do so use CBD oil, administered orally or in their animal's food. Although the initial research has not thrown up any great dangers from taking CBD, there are some indications that it can affect saliva production, leading to dogs having dry mouths and, in hot weather, making it more difficult for them to keep cool through panting.

To sum up, CBD might well be beneficial for pets but in Britain it remains illegal to market CBD products for animal use and companies that do so are breaking the law. Vets may nevertheless prescribe CBD to animals if they consider it might be beneficial. Pet owners have described CBD as being helpful for animal anxiety and seizures, and for the control of inflammation and pain.

> "PRELIMINARY RESEARCH INDICATES CBD POSES NO DANGER TO ANIMALS"

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BEGINNER'S GUIDE TO CBD

Future PLC Quay House, The Ambury, Bath, BA1 1UA

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Cover images
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Photography
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Printed in the UK

Distributed by Marketforce, 5 Churchill Place, Canary Wharf, London, E14 5HU
www.marketforce.co.uk – For enquiries, please email:
mfcommunications@futurenet.com

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The Beginner's Guide to CBD First Edition (LBZ4821)
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BEGINNER'S GUIDE TO

CBD

EVERYTHING YOU NEED TO KNOW ABOUT CANNABIDIOL

WHAT IS CBD GOOD FOR?
CBD is claimed to help a wide variety of conditions. We evaluate the evidence

The power of hemp

How cannabidiol can alleviate
symptoms of common ailments

7 WAYS TO TAKE CBD
Getting the best out of CBD is all about finding the right method and dosage for you. Everyone is CBDifferent!
1 OIL
2 CAPSULES & TABLETS
"THEY ARE FREE FROM THE OFF-PUTTING FLAVOUR OF OIL"
3 GUMMIES

How to take CBD

From oils and gummies to balms,
there are many ways to try CBD

A GOOD NIGHT'S SLEEP
Why we find it difficult to sleep and what we can do about it
"LACK OF SLEEP INCREASES THE RISK OF HEART DISEASE AND STROKE"
What we can do to sleep better
Why sleep is more difficult today

Catch some ZZZs

Why sleep is such a struggle,
and how CBD can help you rest

"MANY OF THE BENEFITS OF CBD ARE ROOTED IN THE VITAMINS AND MINERALS"
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